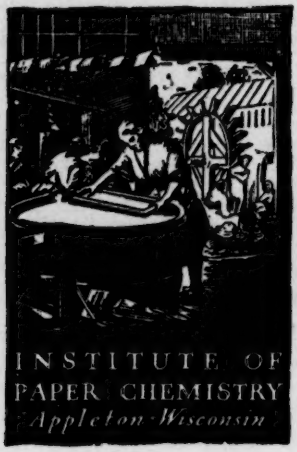
PAGES 379-464

BULLETIN

OF

THE INSTITUTE OF PAPER CHEMISTRY



AFFILIATED WITH

LAWRENCE COLLEGE

APPLETON, WISCONSIN

LIBRARY NOTES

FEBRUARY · 1950

Volume 20 Number 6

THE cut on the cover is a reproduction of the Bookplate of The Institute of Paper Chemistry. The drawing, entitled, "the Papermaker," first appeared in 1698 in the Book of Trade by Christoff Weigel. This particular reproduction has been copied from an illustration appearing on page 43 of Dard Hunter's book "Papermaking Through Eighteen Centuries," published in New York in 1930 by William Edwin Rudge. THE INSTITUTE is greatly indebted to Mr. Hunter for permission to use the illustration.

BULLETIN

of

THE INSTITUTE of PAPER CHEMISTRY

AFFILIATED WITH

LAWRENCE COLLEGE

APPLETON, WISCONSIN

FEBRUARY · 1950

Volume 20 Number 6

LIBRARY NOTES

The Bulletin of The Institute of Paper Chemistry is published monthly at Appleton, Wisconsin, by the Board of Trustees of The Institute of Paper Chemistry. Entered as Second Class matter, November 13, 1930, at the postoffice at Appleton, Wis, under the act of August 24, 1912.

THE INSTITUTE OF PAPER CHEMISTRY

Board of Trustees

OFFICERS

ERNST MAHLER	President
D. C. EVEREST	Vice-President
JOHN L. RIEGEL	Vice-President
WESTBROOK STEELE	Executive Director
JOHN G. STRANGE	Secretary-Treasurer
C. B. SITTERSON, JR.	Assistant Secretary

TRUSTEES

NATHAN M. PUSEY, President of Lawrence College, ex officio

For the term expiring in 1950

DAN K. BROWN, Neenah Paper Company, Neenah, Wis.
GEORGE E. DYKE, Robert Gair Company, New York, N.Y.
STUART E. KAY, International Paper Company, New York, N.Y.
A. B. LAYTON, Crown Zellerbach Corporation, San Francisco, Calif.

For the term expiring in 1951

ALEXANDER CALDER, Union Bag & Paper Corporation, New York, N.Y.
SYDNEY FERGUSON, The Mead Corporation, Dayton, Ohio.
ERNST MAHLER, Kimberly-Clark Corporation, Neenah, Wis.
W. IRVING OSBORNE, JR., Cornell Wood Products Company, Chicago, Ill.
KARL E. STANSBURY, Thilmany Pulp and Paper Company, Kaukauna, Wis.

For the term expiring in 1952

D. C. EVEREST, Marathon Corporation, Rothschild, Wis.
DAVID L. LUKE, JR., West Virginia Pulp and Paper Company, New York, N.Y.
HERBERT T. RANDALL, The Champion Paper and Fibre Company, Hamilton, Ohio.
JOHN L. RIEGEL, Riegel Paper Corporation, New York, N.Y.
NORMAN W. WILSON, Hammermill Paper Company, Erie, Pa.

STANDING COMMITTEES OF THE TRUSTEES

EXECUTIVE COMMITTEE: Ernst Mahler, Chairman; D. K. Brown, George E. Dyke, David L. Luke, Jr., and Karl E. Stansbury.
INVESTMENT COMMITTEE: Ernst Mahler, Chairman; D. K. Brown, John G. Strange, and Ralph J. Watts.
COMMITTEE ON ACADEMIC POLICY: Nathan M. Pusey, Chairman; Rex Hovey, Harry F. Lewis, Ernst Mahler, John L. Riegel, Westbrook Steele, and John G. Strange.

Books and Pamphlets Added to the Library During January

BOARD

NORTHEASTERN WOOD UTILIZATION COUNCIL. Wallboard production and uses; report of conference at Cambridge, Mass., September 16, 1949. Bulletin no. 31. New Haven, The Council, 1950. 183 p.

CHEMISTRY, ORGANIC

BEILSTEIN, FRIEDRICH KONRAD. Beilstein's Handbuch der organischen Chemie. 4. Aufl. Zweites Ergänzungswerk, die Literatur von 1920-1929 umfassend, herausgegeben und bearbeitet von Friedrich Richter. Berlin, etc., Springer-Verlag, 1949. 10. Band. 951 p.

COLLOIDS

KRUYT, H. R., ed. Colloid science. New York, etc., Elsevier Publ. Co., 1949. v. II: Reversible systems. 753 p.

CONTAINERS

BRITISH STANDARDS INSTITUTION. Introduction to packaging; British standard packaging code. British standard: 1133, sections 1-3: 1949. Section 1: Choice of containers and method of packaging. Section 2: Storage of packaging materials. Section 3: Addressing, marking and identification. London, The Institution, 1949. 36 p.

ENGINEERING—ESTIMATES AND COSTS

BULLINGER, CLARENCE E. Engineering economic analysis. 2d ed. New York, McGraw-Hill Book Co., 1950. 397 p.

OPTICS

VALASEK, JOSEPH. Introduction to theoretical and experimental optics. New York, Wiley [c1949] 454 p.

PULP—TESTING

RULES for sampling and testing consignments of wood pulp to determine the quantity delivered (Effective 1st January, 1950). Approved by: The Paper Makers' Association of Great Britain and Ireland, 1912 (Incorporated), *and others* . . . London, The Association, etc. [1949] 35 p.

THERMODYNAMICS

GLASSTONE, SAMUEL. Thermodynamics for chemists. New York, Van Nostrand [c1947, reprinted 1948] 522 p.

TREES

McARDLE, RICHARD E. The yield of Douglas fir in the Pacific Northwest. With a section on application of yield tables by Walter H. Meyer, and a supplemental treatment by Donald Bruce. Revised. U. S. Dept. of Agriculture. Technical Bulletin no. 201. Washington, U. S. Govt. Print. Off., 1949. 74 p.

WOOD

[GREAT BRITAIN] *Department of Scientific and Industrial Research.* A handbook of Empire timbers. Rev. ed. London, H. M. Stationery Office, 1945. 142 p.

Survey of Periodical Articles

The following are abstracts of opinions expressed by writers in the technical journals. The Institute of Paper Chemistry takes no responsibility for the opinions here summarized.

ADHESIVES

WERNER, KARL. The manufacture and application of synthetic adhesives. Kunststoffe 39, no. 11: 283-7 (November, 1949). [In German]

The author describes synthetic adhesives prepared from dispersions of nitrocellulose, polyvinyl acetate, polyvinyl ethers, polyisobutylene, polyvinyl chloride, and nonhardening condensation products of diisocyanates and similar products in solvents; reference is also made to adhesives using genuine rubber and dispersions of plastics or rubber in water. Applications in the shoe industry are reviewed. In conclusion, the shearing strength of different adhesive systems involving leather and rubber and a test procedure with a tear tester are discussed. 1 table. E.S.

ADVERTISING

MUELLER, ROBERT W. Self-service demands new merchandising. Fibre Containers 34, no. 12: 140-1 (December, 1949).

Brief reference is made to recent market studies which emphasize the importance of shelf position on self-service sales, despite heavy consumer advertising. Examples are given which show that items on the waist- or eye-level shelves always secure better sales than advertised products on the bottom shelves. Other tests indicate the advantages of price marking over no price listing and of multiple-item displays over single-item displays. E.S.

ALKALINE PROCESSES

ANON. The "soda-sulfur" cooking process for the manufacture of pulp. Papeterie 71, no. 12: 495-7 (December, 1949). [In French]

Reference is made to Carlander's patented caustic soda-sulfur process, for which the following advantages are claimed: increase in pulp yield and strength, reduced cooking period, and a decrease (in part) in the odors usually resulting from the kraft cook. The process has been successfully applied to most European pulpwoods, as well as to African hardwoods, on a laboratory scale. It is recommended for the pulping of pine (remaining after the disastrous fires in the summer of 1949 in the forests of Landes). Mill-scale cooks gave a yield of 51.9% as compared with 41.1% obtained by the sulfate process. L.E.W.

BEATER ADDITIVES

JAYNE, JACK E., TONGREN, JOHN C., and JACKSON, DONALD T. Use of beater and headbox additives for the improvement of sheet characteristics. Tappi 33, no. 1: 32-5 (January, 1950).

Materials proposed for addition to pulps and to papermaking furnishes for the improvement of sheet characteristics are listed, including locust

bean gum, guar mucilage, deacetylated karaya gum, PFL (a mannogalactan manufactured by Stein-Hall and now called "Lycoid"), methylcellulose, carboxymethylcellulose, Traposize C (a mixture of converted tapioca starch and rosin size), Tufjel (a specially treated starch), latex, Amberlite W-1, soluble starch, sucrose, apple pectin, gelatin, flax and psyllium seed extracts, and formaldehyde; their performances are compared. A critical survey of recent literature discloses many contradictory results, some of which may be based on the addition of wetting agents, the pH of the process water, and the heat treatment in drying the sheets. The need for further investigations is indicated. 34 references. E.S.

BEATING

KILPPER, WILHELM. Changes in fiber-length distribution during beating. Das Papier 3, no. 17/18: 342-50; no. 19/20: 386-93 (September, October, 1949). [In German]

The shortening of various pulps which takes place in the course of the beating processes was studied by means of fiber-length distribution curves. The pulps investigated were normal sulfite and sulfate, purified sulfite and sulfate, as well as different rag halfstuffs. Unbeaten stock was measured first. Fiber-length distribution data are presented both by number and by "weight." This weight percentage is obtained by dividing the sum of the fiber lengths in an individual length class by the sum of the fiber lengths for all length classes. By this method the rag halfstuff was characterized by a strikingly greater long-fiber portion. The investigation of lightly beaten fibers showed that sulfite pulp was shortened more rapidly than sulfate pulp and that the highly purified sulfate pulp formed remarkably few fines in the first phase of beating, whereas tenderized cotton rag pulp was very quickly enriched with short fiber. Linen halfstuff was shorter and slower than cotton after beating. In the study of highly beaten fibrous material, considerable fiber shortening could be shown in all types of fibers. The presence of longer fibers with a relatively high proportion of short fibers in rag halfstuffs is related to the use of textile fabrics as a pulp source. It was established, in a related experiment, that beating with a hollander tackle has less shortening effect on fibers than that of the Jokro mill. Careful beating in the hollander leaves a greater portion of long fibers in the pulp but simultaneously forms a considerable fraction of short fibers. 7 tables and 18 figures. I.H.I.

BLACK LIQUOR

COLLINS, T. T., JR. Some aspects of oxidizing sulphate black liquor. Paper Trade J. 130, no. 3: 37-40 (Jan. 19, 1950).

Following a review of the literature on sulfur losses in sulfate mills, the research on this problem at Thilmany Pulp and Paper Co. is discussed. It was found that destructive distillation of the black liquor in the rotary burner is responsible for the major portion of sulfur losses, and these losses can be reduced by oxidation of the unoxidized sulfur compounds in the black liquor. The possibility of oxidation by the addition of chemicals, such as sodium or hydrogen peroxide, was investigated, but was found to be economically impractical. Oxidation by aeration of the black liquor can be obtained at a negligible cost. 10 tables and 9 references. J.A.B.

BLEACHING

CROWLEY, E. L. Control of pH in low consistency bleaching. Paper Ind. 31, no. 10: 1200-1 (January, 1950).

An installation is described for the automatic pH control of pulp in the second chlorination stage of multistage bleaching, where lime is used for the

neutralization of the stock. A set of Beckman electrodes (consisting of a glass electrode, a calomel electrode, and a resistance thermometer) was mounted in the top of a horizontal pipe handling the 3.5%-consistency stock and connected to an indicating amplifier. The results obtained were so satisfactory that the amplifier was connected to a recording controller which automatically regulates the flow of lime into the pulp. Although the recorder charts do not show a "straight line" for the pH control, they are indicative of rather close control. Further improvements in the setup are still necessary. 2 illustrations and 1 flow diagram. E.S.

SEYB, L. P., and FOSTER, J. L. Bleaching of cotton—a proposed continuous hypochlorite bleaching process. Am. Dyestuff Reptr. 39, no. 1: P20-6 (Jan. 9, 1950).

A process is proposed for bleaching cotton goods by continuous methods utilizing, essentially, caustic soda and sodium hypochlorite solutions. Cotton goods which have been singed are pretreated by impregnating with sodium hypochlorite solution having a pH between 8 and 9, and an available chlorine concentration between 1 and 4 g./liter. After squeezing to about 100% solution content the goods are allowed to steep for one-half hour. Thorough rinsing is followed by saturation of the goods with a 0.5-1.0% solution of caustic soda, followed by steaming for 20-30 minutes. This is followed by rinsing, saturation of the goods with a 3-4% solution of caustic soda, and steaming for another period of 20-30 minutes. The double caustic saturation-steaming operation for the indicated period of time is preferable to a single caustic saturation and steaming for one hour. The goods are then treated with sodium hypochlorite solution using the same conditions as those described for the pretreating operation. After rinsing and the usual finishing steps a fabric is obtained having better whiteness and tensile strength than that usually obtained in commercial bleacheries by classical hypochlorite bleaching methods. 11 tables and 2 references. E.S.

BLEACHING—SULFATE

SAVAGE, J. V. (moderator), *and others*. Bleaching of kraft pulp —round table. Tappi 33, no. 1: 71-5A (January, 1950).

The text is presented of the round-table discussion on kraft bleaching, which was held during the Alkaline Pulping Session of the 1949 TAPPI Fall Meeting at Portland, Ore. E.S.

BOARD

ANON. Vestpocket encyclopedia on paper boards. Paper & Twine J. 23, no. 11: 12, 16-7 (January, 1950).

A brief description is given of the nature and uses of various types of board, such as solid board, filled vat-lined board, sheet-lined board, mill-lined board, patent coated board, pasted board, and document manila. J.A.B.

BANKS, W. H., and COUPE, R. R. Grease-proofing carton boards. Patra J. 12, no. 3: 20-1 (September, 1949).

In an investigation of the possibility of greaseproofing carton boards with alginate solutions, it was found that 3 or 5% solutions of sodium alginate provide resistance to grease penetration, but that calcium alginate is not effective. The need for further work on the subject is indicated. 1 table. J.A.B.

ELMENDORF, ARMIN. Hard facts on hardboard. Wood 4, no. 12: 20, 43 (December, 1949); 5, no. 1: 30, 40-2 (January, 1950).

Hardboard is harder, more stable dimensionally, more scuff-resistant, stiffer, and stronger than wallboard of the beaverboard type; the fibers are bonded together to form a homogeneous mass. The bonding may be the result of chemical changes that take place in the composition of the fiber or may be brought about by the addition of extraneous binders. A true hardboard retains its thickness with very little swelling when it becomes wet. The author discusses the cost of the fibrous raw material in the form of cordwood (resulting in wood-fiber hardboard) and wood waste (yielding granular-wood hardboard). All hardboard types fall into one of the five categories, the manufacturing principles of which are briefly outlined: the continuous wet process, including Masonite; the batch wet process; the semidry batch process; continuous wet felting with dry pressing; and the dry process for producing granular hardboard. With the exception of the last-mentioned procedure, all boards produced by the other methods are of the fibrous type. Tabulated data with estimated manufacturing costs under different conditions are included. 3 tables. E.S.

BOARD—CONVERSION

ANON. APACO—largest converting plant under one roof in the South. Shears 68, no. 685: 10-12, 14 (January, 1950); Paper Mill News 73, no. 6: 8 (Feb. 11, 1950); Paper Trade J. 130, no. 6: 32-3 (Feb. 9, 1950); Paper & Paper Products 91, no. 10:1, 11 (Feb. 5, 1950); Am. Boxmaker 39, no. 2: 24-5 (February, 1950); Fibre Containers 35, no. 2: 64-5 (February, 1950).

An illustrated description of the new folding-box and corrugated-container plant of the Atlanta Paper Co., at Atlanta, Ga., is given, with particular reference to the materials-handling installations. The main products of the company are kraft board containers for bottles, corrugated cases (including the Belsinger shipping containers for textiles), and folding boxes. The company recently developed a new process for printing bright colors and opaque white on natural brown kraft board; with this new process of rotary printing, the company is running up to 600 ft./min., sheeting or rewinding from the roll. 7 illustrations. J.A.B.

BOARD MILLS

ANON. New board mill at Springfield, Oregon. Paper Ind. 31, no. 10: 1186-93 (January, 1950); *cf.* B.I.P.C. 20: 234-5.

A profusely illustrated description of the new Weyerhaeuser board mill and its different installations is given. E.S.

ANON. New mill built in Georgia. Pulp & Paper 24, no. 1: 43-4 (January, 1950).

Brief reference is made to the recently completed plant of the Austell Box Board Corp. at Austell, Ga., which uses waste paper as the raw material. The six-cylinder board machine built by Moore & White is driven by a Syco drive installed in connection with a Westinghouse steam turbine. 9 illustrations. E.S.

GRANBERG, W. J. Weyerhaeuser wins waste war. Wood 5, no. 1: 18-19 (January, 1950); *cf.* B.I.P.C. 20: 234.

A brief description is given of the new sulfate board mill of Weyerhaeuser at Springfield, Ore., with particular reference to the integration of operations by sawmill, kraft mill, and power plant on the same site. Timber

which cannot be converted to lumber is useful for kraft pulping; leftover dirty wood, containing bark and unsound pieces, is hogged to feed the boilers of the power plant. The recovery of by-products is so complete that only about 60% of the fuel is supplied from the mill operations. Hog fuel bought from sawmills in the vicinity and domestic fuel oil make up for the deficiency. Approximately half of the steam and power requirements of the pulp mill are supplied by the recovery operations of the black liquor. 3 illustrations. E.S.

BOARD MILLS—DIRECTORIES

FIBRE CONTAINERS. Official board mill directory. Fibre Containers 34, no. 12: 74, 76, 78, 80-8, 90-8 (December, 1949); *cf.* B.I.P.C. 19: 382.

Lists of board mills are given, including a regular list arranged by states and giving information on grades of regular paperboard manufactured, equipment and machine trims, capacity, power data, and grades of pulp and paperstock used; a specialty board mill list arranged by states, with information on grades of specialty paperboard manufactured, equipment and machine trims, and capacity; and an alphabetical list of board mills, giving the name and address. The first and third sections include listings of Canadian mills. J.A.B.

BOARD SPECIALTIES

ANON. Greenhouse. Modern Packaging 23, no. 5: 110-11 (January, 1950).

The Hewett P. Mulford Co., Lebanon, Ohio, has introduced an ingenious package that looks and actually serves as a miniature greenhouse for prepotted bulbs. The bulbs are prepared in pots consisting of die-cut segments of heavily waxed kraft board covered with a thick, hard-tempered aluminum foil, either green or gold. The filled pots are placed in one-piece, die-cut, prescored, and preglued frames of kraft board which have a reinforcing cross member just above the pot through which the sprouting plant may grow. The frame has transparent panels on two sides, printed with white lines in a windowpane effect; the other two sides are printed with directions and a reproduction of the flower as it will appear when fully grown. 2 illustrations. J.A.B.

MORAINE BOX COMPANY, *Dayton, Ohio.* Wood-cleated pallet loads. Fibre Containers 34, no. 12: 98 (December, 1949).

A pallet loading method employs combinations of corrugated board, wood cleats, and wood blocks. The pallet base, made of corrugated board and wood cleats, is supported by attached wood blocks, which rest on strips of corrugated board. The decks consist of corrugated board sandwiched and framed at all edges with wood cleats, which act as flanges to hold in place the objects being packed. The entire load may be secured with steel strapping. 3 illustrations. J.A.B.

WESTBILT FORMS, INC., *Newark, N.J.* Corrugated forms for concrete. Fibre Containers 34, no. 12: 54, 56, 58 (December, 1949).

The company recently introduced forms made of corrugated board which provide a base for pouring concrete floors when casting directly on grade or fill. The forms are made in sections four feet long, two feet wide, and three inches high, each section consisting of three parts. The main piece is a sheet of board cut and creased to form two rectangular tubes, and the other two pieces are slipped into the tubes to reinforce them. The corrugated board is paraffined to resist moisture, and the insulating air spaces are said to make a 25% warmer floor. A radiant heating system may be

assembled on top of the forms, and changes in wiring, conduits, etc., are easily made through the corrugated tubes. 2 diagrams and 4 illustrations.
J.A.B.

BUSINESS CONDITIONS

CORNELL, JOHN. Business forecast for 1950. Paper Mill News 73, no. 3: 14, 16 (Jan. 21, 1950); *cf.* B.I.P.C. 19: 383.

The author predicts another year of high production, full employment, and high-level consumption for 1950, with a 5% increase in total paper and paperboard consumption over 1949 (estimated to be 1,500,000 tons lower than in 1948). On the whole, the supply and demand situation for paper and paperboard is reasonably balanced and supplies of essential papermaking materials (pulp, waste paper, clays, and essential chemicals) are in adequate supply. A tabulated comparison of paper, board, and pulp production for 1948 and 1949 (data estimated) is included. E.S.

CAUSTIC SODA

CHEMICAL ENGINEERING. Caustic soda versus construction materials. Chem. Eng. 56, no. 12: 213-14, 216, 218, 220 (December, 1949); 57, no. 1:213-14, 216; no. 2: 215-16, 218, 220, 222 (January, February, 1950).

This is a symposium in which manufacturers of typical construction materials evaluate their products for services involving caustic soda. The following materials are considered: Chlorimet, Worthite, lead, glass linings, rubber linings, high-silicon iron, stainless steel, cements, carbon and graphite, silicones, iron and steel, protective coatings, nickel and nickel alloys, and Durimet; chemical stoneware, aluminum, and tantalum are not recommended.
E.S.

CELLULOSE

MELLER, ALEXANDER. The potassium permanganate method for determining the reducing end-group content of cellulose, with comments on a novel concept of the molecular structure of cellulose. Tappi 33, no. 1: 11-15 (January, 1950); *cf.* B.I.P.C. 18: 358-9.

On subjecting a surgical cotton sample to the action of potassium permanganate solution in the presence of sulfuric acid at 0° C. for increasing periods of time, the oxidation reaction did not proceed to completion, as claimed by the originators of this method for determining the end-group content of cellulose. A variation of the amounts of potassium permanganate and sulfuric acid changed the rate of oxygen consumption, but a leveling off in the oxidation-rate plots could not be observed. Hydrocelluloses prepared from the surgical cotton cellulose showed an apparent lower reducing power as evidenced by a slower oxygen consumption. Only 0.3% of the material was solubilized during the acid treatment of the cellulose sample in preparing the hydrocelluloses. This removal in conjunction with the polymolecularity and the supermolecular structure of cellulose in fibers (amorphous and crystalline regions) may explain the lower oxidizability (reactivity toward acid permanganate solution) of the hydrocelluloses. The novel concept of the hemiacetal cross-linked cellulose structure is discussed. It appears that the experimental evidence pertaining to the postulations are either insufficient or contradictory. Many observations of the originators of the novel concept of cellulose constitution may be explained by the polymolecularity of the glucose chains and by the supermolecular structure of cellulose fibers. More experimental evidence is needed to stablish conclusively the presence of covalent cross bonds operating between adjacent glucose chains in cellulose fibers. 2 tables, 4 figures, and 22 references.
E.S.

OTT, EMIL. The relation of physical characteristics and chemical structure of cellulose derivatives. Chemistry & Industry [68] no. 53: 915-22 (Dec. 31, 1949).

Using cellulose as a typical long-chain type of polymer, the fundamental properties and the relationships between physical properties and chemical structures of organic high polymers suitable for plastics are discussed. Many apparent anomalies in the correlation of theoretical and experimental data are clarified. The nature of the intermolecular forces of cellulose and the rigidity of this chain molecule are reviewed. The modification of the cellulose molecule by the introduction of substituent groups, and the profound influence of the nature, size, and distribution of the substituent, as well as the degree of substitution, on such properties as moisture sensitivity, softening point, tensile strength, and solubility are described. An account of swelling and association-compound formation as preliminaries to solution, and theoretical considerations of the action of nonsolvent plasticizers are also given. 3 tables, 16 figures, and 7 references. E.S.

PERCIVAL, E. G. V., and Ross, A. G. Marine algal cellulose. J. Chem. Soc.: 3041-3 (November, 1949).

Algal cellulose, isolated from various species of marine algae, has been shown to be essentially the same as cotton cellulose. Hydrolysis with 72% sulfuric acid gave only D-glucose. Cellobiose octaacetate has been prepared by acetolysis, indicating the presence of 1,4-β-linkages, a fact confirmed by oxidation with sodium periodate. Determinations by potassium periodate oxidation indicate a chain length of 160 units, but the original cellulose may have been degraded during isolation. X-ray diagrams of algal cellulose show the characteristic pattern of normal cellulose. E.S.

SVEDBERG, THE. Giant molecules in solution. J. Franklin Inst. 248, no. 6: 469-72 (December, 1949); *cf.* B.I.P.C. 19: 692-3.

In discussing the development of the present knowledge of high-molecular substances, the author states with reference to the polysaccharides in the vegetable kingdom, particularly cellulose, that they are mostly built of thread-like macromolecules which are more or less polydisperse. However, the formation of cellulose in the plants follows different ways from those observed when high polymers are synthesized *in vitro*. The distribution curve for the molecular weights of native cellulose possesses several maxima which indicates the accumulation of certain molecular sizes in distinct groups. The cellulose as it occurs in wood is closely bound to lignin and it takes a chemical treatment to liberate it. If this is performed with care, the product appears to be equally as well defined as the much less firmly bound cellulose of the cottonseed hairs. Both in the case of wood and cotton cellulose, the distribution curves show maxima at D.P.'s of about 100, 200, and 300 glucose units. By partial hydrolysis of native cellulose it has quite recently been possible to prepare a kind of cellulose colloid built of fairly equally sized rods which possess a length corresponding roughly to 100 glucose units as determined by the electron microscope. Electron diffraction studies of these rods have shown that they possess a very regular crystal lattice of the same general type but better defined than the cellulose fibers according to previous x-ray studies. The micelles as they occur in fibers are apparently partially hidden by amorphous material and thus less accessible to x-ray studies than in the isolated state. Hence, these rods are probably the real elementary cellulose particles. They consist of bundles of parallel molecules of the type observed by means of the ultracentrifuge in cellulose solutions. E.S.

CELLULOSE—DENSITY

STEURER, ERWIN, and KATHEDER, FRIEDRICH. Density and state of order of mechanically modified cellulose. Kolloid-Z. 114, no. 2: 78-88 (August, 1949). [In German]

By dry grinding partially crystalline high polymers, such as cellulose, in an oscillating mill, the characteristic x-ray diffraction pattern disappears and only broad diffuse rings are obtained. On wetting the ground material with a nonsolvent (such as water) or on moderate heating, the crystalline x-ray diagram reappears and from this ease of recrystallization the effect is attributed to a specific mechanical deformation involving only segments of the chain molecules. In the present work, the densities of native and hydrate cellulose have been measured by the carbon tetrachloride suspension method before and after such grinding and after recrystallization. The density of the native cotton cellulose (1.558) was considerably higher than that of the hydrated staple-fiber cellulose (1.521), but on grinding they both decreased to about the same value (1.509). After moistening with water, at 20 and 100° C., or after heating at 180° C., the density rose again to 1.520-1.536. Sucrose and cellobiose show a similar density decrease after this type of grinding, but glucose (dextrose) does not. On the basis of the density of crystalline cellulose calculated from x-ray studies (1.588) and the experimentally and mathematically derived density of completely amorphous cellulose (1.482-1.489), the data are used to obtain quantitative values for the degree of crystallinity of different cellulose systems, namely 71% for cotton, 35% for rayon staple fiber, 22-24% for ground cellulose, and 33-49% for the cellulose recrystallized after such grinding (limits of error 4%). By recrystallization of hydrate cellulose after grinding in the oscillating mill the degree of crystallinity may be increased to 14% more than the original value before grinding. From the volume differences, calculations are also made of the extent of the mechanical deformation and the magnitude of the force involved. There is some evidence that the unit of molecular segment affected in the deformation contains at least two glucose units, but further experiments must be performed to establish this point. 5 tables, 6 diagrams, and 17 references. M.A.H.

CELLULOSE ETHERS

MORRISON, R. I., and CAMPBELL, B. Water-soluble cellulose ethers as emulsifying agents. J. Soc. Chem. Ind. 68, no. 12: 333-6 (December, 1949).

The emulsifying powers of various water-soluble cellulose ethers for mineral and vegetable oils are compared. The advantages of mixtures of sodium carboxymethylcellulose with other water-soluble cellulose ethers in producing improved emulsions with reduced foam are shown. Consideration is given to the relative interfacial tensions of methylethylcellulose and sodium carboxymethylcellulose and to the effects of temperature and hydrogen-ion concentration on emulsions prepared from them. 7 tables, 1 diagram, and 9 references. E.S.

POLLOK, F. J. The uses of sodium carboxymethyl cellulose in paper-making. Paper-Maker (London) 118, no. 5: 331, 349 (November, 1949).

The author discusses the use of carboxymethylcellulose as a beater additive and as a coating and greaseproofing agent. 13 references. E.S.

REID, J. DAVID, and DAUL, GEORGE C. The preparation and properties of alkali-soluble metal carboxymethylcellulose fibers. Textile Research J. 19, no. 12: 794-801 (December, 1949).

It has been shown, both on a laboratory scale by a method suitable for use in lecture demonstration work and on a pilot-size spinning machine, that metal carboxymethylcellulose fibers may be produced from sodium carboxymethylcellulose and suitable metals which are capable of cross linkage to yield fibers with strengths ranging from 1 to 2 grams per grex. A mixed copper-aluminum carboxymethylcellulose fiber was the most satisfactory from the standpoint of strength, appearance, flexibility, feel, and like characteristics. The fiber is similar to the alginic acid fibers developed in England and, if commercially developed, should be suitable for novelty fabrics and similar uses where an alkali-soluble fiber is desired. 3 tables, 3 figures, and 17 references. E.S.

STEELE, RICHARD, and PACSU, EUGENE. Cellulose studies. XIII. The heterogeneous hydrolysis of trimethyl cellulose. Textile Research J. 19, no. 12: 771-83 (December, 1949); *cf.* B.I.P.C. 20: 237.

The preparation of trimethylcellulose and its hydrolysis with 1 *N* hydrochloric acid at 60 and 80° C., and with 0.05 *N* hydrochloric acid at 60° C. were studied. The course of the hydrolysis is similar in each case and a limiting D.P. of 60 is indicated. The distance between acetal linkages in the periodic structure proposed for cellulose is interpreted as the number of glucose residues. An equation for an apparent rate constant is derived, assuming first-order reaction kinetics. The apparent-rate constant changes rapidly at first, but more and more slowly as the D.P. falls from 900 to 60. The order of magnitude of the limiting D.P. value, which has been determined viscosimetrically, was confirmed by hypoiodite titration. Partially methylated cellulose (30% methoxyl groups) was hydrolyzed with 2 *N* sulfuric acid at 70° C. The results confirm the topochemical nature of the methylation reaction. 12 tables, 14 figures, and 20 references. E.S.

STEELE, RICHARD, and PACSU, EUGENE. Cellulose studies. XIV. The fractionation and solubility of trimethyl cellulose. Textile Research J. 19, no. 12: 784-90 (December, 1949).

Trimethylcellulose was fractionated from chloroform-hexane and pyridine-water systems. The difficulties involved are described and lead to the conclusion that neither system is suitable for such a fractionation. These difficulties are related to the solubility behavior of methylcellulose, which is discussed in the light of present theories of polymer solubility. 2 tables, 2 figures, and 5 references. E.S.

CELLULOSE FILMS, TRANSPARENT

KRAFT, A. A., and WANDERSTOCK, J. J. Meat-color problem is closer to solution. Food Inds. 22, no. 1: 65-9 (January, 1950).

The results of an antidiscoloration investigation at Cornell University indicated that, of the wrappers tested, rubber-base film was best for fresh meat, whereas cellophane was best for cured meat and, of the antioxidants considered, NDGA (0.01%) was most effective for fresh meat. Color is affected by temperature, intensity and length of exposure to light, breed and preslaughtering operations, and the length of time the meat is exposed to air before packaging. Tests were conducted to determine the change in color of round steaks and ham when treated with various antioxidants and packaged with different wrappers; detailed results are given in table form. Wraps used were cellophane A, cellulose acetate, a rubber-base film, and cellophane B. The antioxidants used were nordihydroguaiaretic acid (NDGA) in various concentrations and antioxidants 2 (food inhibitor grade of hydroquinone), 3 (food inhibitor grade of butylated hydroxyanisole), and 4 (a

propylene glycol solution of antioxidants 2 and 3 and citric acid). Color was judged visually with a Munsell color panel. Statistical studies were made of the results, the average deviations determined, and the mean color change considered. 3 tables, 1 illustration, and 12 references. J.A.B.

CHEMICAL TESTING—PULP—ASH

CENTRAL LABORATORY OF THE CELLULOSE INDUSTRY. *Analysis Committee.* Determination of ash and ash constituents in dissolving pulp. Svensk Papperstidn. 52, no. 21: 536-42 (Nov. 15, 1949). [In Swedish and English] *cf.* B.I.P.C. 19:695.

The text of the Swedish Standard CCA19 is given, covering the preparation of the sample, ignition, analysis of the ash for residue insoluble in hydrochloric acid, the determination of ferric oxide and aluminum oxide, calcium oxide, iron, manganese, and copper, and color measurement (either photometric or colorimetric). 2 figures of the ignition apparatus in the Swedish text. E.S.

CHEMICAL TESTING—PULP—CUPRAMMONIUM VISCOSITY

HUBER, K. Physico-chemical measurements on cotton and linen fabrics. Textil-Rundschau 4, no. 9: 310-28; no. 12: 431-42 (September, December, 1949). [In German; French summary]

The comparative anatomical and microscopic structures of cotton and linen fibers and the chemical structure of cellulose from these sources are reviewed. The principles of viscosity measurement, the units employed, and the application of capillary viscometers to cuoxam solutions of cellulose are discussed. The author has examined the tube viscometer, its application in the TAPPI method, and the mode of calibration on glycerol solutions. He concludes that the standardization of a viscometer on a single glycerol solution does not result, according to the TAPPI formula, in accurate determinations at other viscosity values. This deviation is attributed to lack of constancy of the TAPPI factor $d[t - (k/t)]/C$ at different viscosity levels. This instrumental error can be eliminated by determining the viscosities of cuoxam cellulose solutions and of the corresponding glycerol solutions of known viscosities in such a way that the cuoxam and glycerol tests have the same time of efflux. The factor is then eliminated and the viscosity of the cuoxam solution is related directly to that of the glycerol solution. A time-viscosity chart (or a correction table) is then established, from which, in later tests, the viscosity may be read directly from time of efflux. The author also defines the fluidity number (FZ) which is equivalent to the usual fluidity expressed in rhes. For the preparation of the cuoxam solution, the Fabel modification (*cf.* B.I.P.C. 6: 263), rather than the TAPPI method, is preferred to avoid formation of nitrites. The use of a TAPPI-type viscometer tube of larger dimensions (about 50-ml. capacity) is recommended. To avoid plugging of the capillary by insoluble materials, it is preferable to use as wide a capillary as possible for the desired fluidity range; the capillary employed is somewhat larger than that of the TAPPI viscometer. The weighed sample of cellulose is transferred to the viscometer and the latter is evacuated completely or flushed with nitrogen. The cuoxam solution is introduced from the stock bottle directly through a special filling device. The application of fluidity methods in bleaching and other treatments of cotton and linen used in the textile industry is discussed. Methods for the determination of the D.P. of cellulose and for the mechanical testing of cotton and linen are also described. A combination of viscosity measurements and strength testing is shown to be useful in the evaluation of textile processing. 9 tables, 22 figures, and 52 references. B.L.B.

CHROMATOGRAPHY

BLAND, DAVID E. Separation of vanillin and syringaldehyde by paper partition chromatography. Nature 164, no. 4182: 1093 (Dec. 24, 1949).

Vanillin and syringaldehyde were separated by paper partition chromatography using petroleum ether saturated with water as the mobile phase. After fractionation, the papers were developed by spraying with 0.4% 2,4-dinitrophenylhydrazine in 2 *N* hydrochloric acid. The method was used for examining aldehyde mixtures obtained on oxidation of *Eucalyptus resinifera* Sm. and *Eucalyptus diversicolor* F.v.M. with nitrobenzene and alkali. I.A.P.

CLEGG, DORIS L. Paper chromatography. Anal. Chem. 22, no. 1: 48-59 (January, 1950).

Following a brief history of paper chromatography, a discussion is given of its theories, the apparatus used, and its application to inorganic analysis, sugar separations, medicine and biological chemistry, amino acid separations, and other miscellaneous analyses, with extensive reference to the literature. 9 figures and 229 references. J.A.B.

STRAIN, HAROLD H. Chromatography. Anal. Chem. 22, no. 1: 41-8 (January, 1950); *cf.* B.I.P.C. 388-9.

With emphasis on the nature, mechanism, and modifications of chromatographic analysis, a general discussion and review of the literature, primarily of the last three years, is given under the headings: applicability and nature of chromatography, partition mechanism and variable conditions in chromatographic separations, terminology, rate of migration, adsorption sequence, limitations, chromatography by adsorption, chromatography by partition, chromatography by ion exchange, chemichromatography, and paper chromatography. 3 tables, 6 figures, and 142 references. J.A.B.

COLOR-BLINDNESS

SLOAN, LOUISE L. Comparison of the Nagel anomaloscope and a dichroic filter anomaloscope. J. Optical Soc. Am. 40, no. 1: 41-7 (January, 1950).

The Nagel anomaloscope and a simple filter anomaloscope were used in testing 103 subjects who had deficient color perception for red and green. The filter anomaloscope differentiates the deuteranomalous (DA) and the protanomalous types (PA), but does not distinguish types of defect among dichromats. A small number of subjects seemed to have a transitional defect between anomalous trichromasy and dichromasy. Evidence is presented suggesting that many if not all of these are actually dichromats, who give atypical responses because differences in saturation are mistaken for differences in hue. The two instruments agreed closely in their classifications of subjects as to type and degree of defect. The filter anomaloscope is simpler in procedure and in interpretation of results. 7 tables and 6 figures. E.S.

CONTAINER INDUSTRY—EDUCATION

ANON. FPBAA endorses vocational training in box making. Am. Boxmaker 39, no. 1: 16, 41 (January, 1950); Fibre Containers 35, no. 1: 84, 86 (January, 1950).

A course of study designed to encourage the acquisition of skills used in the manufacture of folding cartons by potential employees has been inaugu-

rated by the Philadelphia group of the Folding Paper Box Association of America, and other groups are following suit. The first six months of the course are devoted to basic training in the design and layout of dies, and the last six months include co-operative employment in a local paper-box plant. Upon graduation, the student is qualified for full-time employment in a die room and additional part-time trade extension training at the school for two years. An outline is given of the course of study. J.A.B.

O'NEIL, JOHN B. Robertson's apprenticeship training program. Shears 68, no. 685: 20-1 (January, 1950).

The formal apprenticeship program in the cutting, creasing, and printing departments, established by Robertson Paper Box Co., Inc., has been cited as the first complete program of its kind in the nation. All employees of the company are eligible, and selections are made on the basis of aptitude and color tests, references, and foremen's recommendations. The program covers a four-year period, including a minimum of 144 hours per year in an approved school; the remainder of the 8000 required hours are devoted to on-the-job training. Upon completion of the course, certificates of accomplishment are presented both by the company and by the Connecticut State Apprenticeship Council. 2 illustrations. J.A.B.

COOKING PROCESS

STRACHAN, JAMES. The invention of wood-pulp processes in Britain during the nineteenth century. Paper-Maker (London) 118, Annual no.: 5-6 (1949).

The author reviews a number of British patents on semichemical, soda, and sulfite pulping granted during the 19th century. He cites the interesting fact that during the period from 1800 to 1860, elementary experiments were made in English mills which covered every modern process for the isolation of cellulose from wood, including the use of caustic alkalies, sulfurous acid, alkaline sulfides, chlorine, and nitric acid. E.S.

CORROSION

ESSEN, CARL-GUSTAF VON. The corrosion problems in sulfate mills. Svensk Papperstidn. 52, no. 22: 549-59 (Nov. 30, 1949). [In Swedish; English and German summaries]

The corrosion problems in the sulfate industry have increased considerably during recent years, so that a special committee was appointed to study these problems in Sweden. The present article is a summary of the results obtained by the committee during the past year. At first the committee surveyed the corrosion difficulties encountered in Swedish sulfate mills, then proceeded with experiments with different types of steel for digesters, evaporators, and electrofilters. These investigations have shown that the presence of silica in steel decreases its resistance to white, green, and black liquors, whereas even a small percentage (1-2%) of nickel or cobalt improves it noticeably. It has been feared that the joint application of plain carbon and stainless steels may cause galvanic corrosion; however, the committee's work has shown that galvanic elements offer good protection to steel and decrease the aggressiveness of sulfate liquors, provided that these liquors contain small quantities of silicic acid or other anodic inhibitors. The corrosive effect of black liquor may be considerably reduced by oxidation according to the method of Bergström and Trobeck. Black liquors from different mills exhibit great variations in corrosiveness, even if their dry-solids contents are similar. The activities of the committee will be continued. 7 diagrams and 6 tables. E.S.

COST—ACCOUNTING

MONTGOMERY, MARGARET J. High cost of reducing production rates. Paper Trade J. 130, no. 2: 33-4 (Jan. 12, 1950).

The author discusses the increased cost resulting from decreased operations in the paper industry, when the profit advantages inherent in the element of continuity are lost. Some costs are reduced automatically when operations are cut, but they are not necessarily reduced in the same proportions as operations; other costs may be lowered by managerial action, but some costs cannot be reduced at all, such as maintenance, fixed salaries, taxes, etc. The greater the reduction in operating hours, the higher will be the cost of the product; a point may be reached where the cost is so high that there is no longer any margin of profit left. The break-even point will vary in different mills; to determine it for an individual plant, a special analysis by competent engineers is required and the effect of the reduced operating rate upon every element of cost and every operation in the entire organization must be taken into consideration. Several examples are given. E.S.

DIGESTERS

TUCKER, E. F. Digester linings for soluble-base sulphite pulping. Tappi 33, no. 1: 29-32 (January, 1950).

Linings designed for calcium-base cooking rely on the filling of the pores of the brick with precipitates formed from the process for complete shell protection. The linings for soluble-base cooking are not readily made impervious by accumulations in the pores of the bricks and must have a basically different composition. The use of ammonia and magnesia cooking liquor has necessitated some very radical changes in digester linings, including the abandonment of the litharge joint. Linings for sodium, magnesia, or ammonia-base cooking may be almost identical as to specification. Considerable operating information on the effects of cooking liquors made with all these bases is now available. Indications are that good success can be expected from the type of lining now being used in several mills. The lining problem must be considered in relation to over 500 existing digesters, many of which may be converted to soluble-base cooking. The construction of these shells prevents the use of certain types of linings which will be considered for future welded shells. New installations, designed specifically for use with a soluble base, may have thinner linings than are now ordinarily used. E.S.

DRYING

FRIEDMAN, SAMUEL J. Drying. Ind. Eng. Chem. 42, no. 1: 38-44 (January, 1950); *cf.* B.I.P.C. 19: 391.

The author reviews the most significant literature on drying during the past year; paper and board drying is included among the specific materials discussed. 237 references. J.A.B.

ECONOMICS, INDUSTRIAL

SHALLCROSS, RUTH E. A report to the paper industry on the need for granting fellowships to economics teachers. Paper Trade J. 130, no. 2: 24-5 (Jan. 12, 1950); Southern Pulp Paper Manuf. 13, no. 1: 20, 22 (January, 1950); Fibre Containers 35, no. 1: 38, 40 (January, 1950).

The author discusses the value of fellowships granted to economics teachers for studying the economic functioning of a large corporation and observing the tremendous role of those in executive positions in making decisions affecting wide areas of our economy. Industry, generally, is alarmed by the

growing separation of economics as taught in the colleges today and as practiced by business and industry. If handled correctly, a summer study in a company could afford teachers of economics the opportunity of understanding the important role of the enterpriser in the American economy. The companies participating in the fellowship program must be aware that these fellowships will probably not reward them financially, but must consider them a public relations expense of a long-term nature. Because the paper industry is a major one and represents competition in its various aspects, it is worthy of much analytical study by economists. Paper-mill executives may wish to co-operate with the program by giving economics teachers the opportunity of testing their theories by observing the economic functioning of their corporation. E.S.

ENZYMES

REED, GERALD. Enzyme technology: a process frontier. Chem. Inds. 66, no. 1: 30-2, 138 (January, 1950).

A review is given of the more important applications of enzymes in industrial chemical processes carried out in the various industries. The paper manufacturer, for example, has found that enzyme conversion of starch is the most economical method of starch modification; bacterial, fungal, and malt diastases are used for this purpose. The resulting high-molecular weight dextrins are used extensively in paper sizing and coating. 2 illustrations and 46 references. J.A.B.

EVAPORATION AND EVAPORATORS

BADGER, W. L., and LINDSAY, R. A. Evaporation. Ind. Eng. Chem. 42, no. 1: 45-7 (January, 1950); *cf.* B.I.P.C. 19: 392.

A review of recent literature on evaporation and evaporators is presented; no new developments in methods or equipment are reported. 36 references. J.A.B.

FIBER—DIMENSIONS

ANDERSON, S. L., and WARBURTON, F. L. The porous plug and fibre diameter measurement. Effect of fibre orientation and use of plugs of randomized fibres. J. Textile Inst. 40, no. 11: T749-58 (November, 1949); *cf.* B.I.P.C. 13: 343-4.

In the previous paper by Cassie the use of plugs of parallel fibers for the determination of the fiber diameter by an air-flow method was described. The fiber diameters of a range of wool tops were found from the projector, and the shape factor k in the Kozeny equation was determined from air-flow results. A further investigation has shown that the degree of fiber parallelism in tops may be sufficiently variable to make the use of parallel plugs inaccurate in certain cases for the determination of the diameter. If the diameter is measured by some other method, the air-flow results on parallel plugs throw light on the amount of fiber parallelism. For a more accurate determination of the fiber diameter, a method of preparing packed beds of cut and randomized fiber pieces has been developed which gives results independent of the initial fiber arrangement. A modification of the original equations is discussed, which allows for slip of the gas molecules at the pore boundaries. 5 tables, 7 figures, and 9 references. E.S.

FIBER—IDENTIFICATION

PRESTON, J. M. The temperature of contraction of fibres as an aid to identification. J. Textile Inst. 40, no. 11: T767-8 (November, 1949).

Since many synthetic fibers have been found to contract when heated, it was suggested that the temperature at which this contraction occurs would be a useful index for their identification, and a simple apparatus has been constructed for this measurement. A metal block is drilled to provide a thermometer pocket and is clamped to a retort stand at a convenient height above a Bunsen burner. The fibers to be tested are passed over the block and laid in a groove; then the block is heated. The temperature is noted when contraction or, as the case may be, melting occurs. The results of this experiment are tabulated for several different fibers. 1 diagram, 1 table, and 1 reference. J.A.B.

FIBER—STRUCTURE

JØRGENSEN, L. Hydrolysis and fine structures of cotton and wood pulp fibers. Acta Chem. Scand. 3, no. 7: 780-2 (1949). [In English]

Experiments are reported which are interpreted as firm evidence that the essential difference in the fine structure of cotton and wood pulp fibers lies in the mesomorphous or transitional areas of the crystallites into the amorphous regions, and that these are much larger in extent in the wood pulp than in the cotton fibers. More extensive investigations are in progress and the results will be published later. Bleached cotton and sulfite pulps (of three different viscosities) were swelled for two hours at 5° C. in a series of sodium hydroxide solutions of different strengths, carefully washed in ice water, and dried in the vacuum oven at 60° C. The water regains were determined at 55% R.H., and the samples were hydrolyzed with 2.5 *N* sulfuric acid at 97° C. for six hours. The average D.P. of the hydrolyzed material was then determined viscometrically on the cellulose nitrate derivative, this value being designated the limit D.P. and assumed to approximate the size of the crystallites with the addition of the mesomorphous areas. The limit D.P. of the cotton remains constant at 140 until the alkalinity of the steeping solution is sufficiently large to cause intramicellar swelling (10%), and a transformation from native cellulose to cellulose II (hydrate), at which point there is a sudden drop to about 95. With the wood pulps, however, the limit D.P. of all the samples (the initial values varying according to the pulp viscosity) decreased gradually as the alkalinity of the swelling solutions increased, until at 8% concentration a sharp drop to about 60 occurred. There was very little, if any, further decrease when the concentration was increased to the 10% mercerizing strength. This behavior indicates that mesomorphous areas are negligible in cotton, or of such a low order as to be penetrated even by water, but that in pulp fibers they are of considerable size and probably vary widely in degree of order. The length of the transitional area seems to be several times that of the crystallite nucleus, and the size of the crystallite of native wood pulp cellulose is about the same as that of cellulose II, whereas in cotton it is definitely larger according to the limit D.P. values. Moisture regains are shown to support these conclusions. 2 tables and 9 references. M.A.H.

FIBER—SURFACE AREA

HUNT, CHARLES M., BLAINE, RAYMOND L., and ROWEN, JOHN W. Submicroscopic structure of cellulose from nitrogen sorption measurements. J. Research Natl. Bur. Standards 43, no. 6: 547-54 (December, 1949); Textile Research J. 20, no. 1: 43-50 (January, 1950).

When cotton linters were soaked in cold 10% sodium hydroxide, washed, neutralized, transferred successively to methyl alcohol and benzene, and carefully dried at reduced pressure, a surface area as high as 71.3 sq.m./g.

was obtained by the Brunauer, Emmett, and Teller technique. Previous areas for untreated cotton were all below 1 sq.m./g. Linters carried through the above steps after soaking in water instead of alkali had an area as high as 47.3 sq.m./g. When the alkali-treated sample was conditioned in water vapor to 3.3% gain in weight, the surface decreased to 31.6 sq.m./g.; further conditioning to an 11.0% gain in weight decreased the surface to 2.1 sq.m./g. The isotherms of the treated samples showed strong hysteresis, whereas the isotherms of untreated cotton showed little or no hysteresis. Calculations of pore-size distribution by the method of Wheeler and Shull indicated that these materials have rather narrow distributions; the alkali-treated material has a maximum at a pore radius of about 20 A. and the water-soaked material a maximum at about 16 A. 2 tables, 3 figures, and 21 references. E.S.

ROBERTSON, A. A., and MASON, S. G. Specific surface of cellulose fibres by the liquid permeability method. Pulp Paper Mag. Can. 50, no. 13: 103-10 (December, 1949).

The resistance to viscous flow of a fluid through a uniform pad of porous material can be expressed by means of the Kozeny-Carman equation, in terms of the void fraction and the surface area of the material comprising the bed. In applying this method to a bed of pulp fibers, it is necessary to know the effective volume of the fibers. Since this is not generally known, the Kozeny-Carman equation has been modified so that the specific surface area and the effective specific volume can be determined simultaneously. This is done by measuring the permeability coefficient of a pad of fibers as a function of the pad concentration. The Kozeny-Carman equation has been found applicable, provided the effective solid fraction exceeds 0.20. The increase in specific surface in the beating process has been measured, but no useful correlations with sheet properties could be found. On the other hand, the effective specific volume, which has been shown to be a measure of the degree of dimensional swelling of the fibers, was found to parallel the development of the burst strength. 6 tables, 9 figures, and 7 references. E.S.

FIBERS

TURNER, A. J. The structure of textile fibres. VIII. The long vegetable fibres. J. Textile Inst. 40, no. 10: P972-84 (October, 1949); *cf.* B.I.P.C. 20: 316.

The general characteristics of the plant, strand, and ultimate fibers and the chemical composition of the bast fibers jute, hemp, ramie, sunn hemp, and the leaf fibers, sisal, Manila hemp, and *Phormium tenax,* are discussed; in several cases reference is also made to the x-ray diagram. 8 tables and 9 figures. E.S.

FLOOR COVERING

ANON. A survey of vinyl floor coverings. Bakelite Rev. 21, no. 3: 10-12 (October, 1949).

The four major types of vinyl floor coverings are resilient tile, rigid tile, continuous flooring, and surface coating on paper; their methods of manufacture and distinguishing features are discussed. The coated paper type is made by precision printing a waterproof paper and then applying a coating based on Vinylite resins. The coated paper is then laminated to a backing material. 5 illustrations. J.A.B.

FOAM

STRACHAN, JAMES. Froth and foam. Paper-Maker (London) 118, no. 5: 332-4 (November, 1949).

The author cites four cases of excessive foaming (in the residual liquor from the bleaching of sulfite pulp, in operations from the De Vains chlorination process, in river water polluted by the effluent from an esparto mill, and in a newsprint mill). In three of these, colloidal lignin and pectin were the responsible frothing agents; a leaking pump gland was the predominant factor in the froth origin in the fourth case. Air and/or a colloidal foaming agent are essential for froth formation. Hence, the first step in the investigation of a persistent froth should be a careful analysis of the froth itself, coupled with a precise knowledge of the physical and colloidal properties of the substances involved. In the author's everyday papermaking experience, the worst frothing agents were those derived from ligneous and pectic residues in the pulp, which produce foam over a wide pH range. The most scientific and practical method of dealing with froth troubles in the paper mill is to prevent the formation of the emulsion from which the froth originates, either by removing the frothing agents from the stock or, where that is impossible, treating the stock in the earlier stages of the preparation with substances capable of breaking the emulsion. E.S.

FOLDING BOXES

ANON. Cell-type "carry-homes" for big apples and persimmons. Am. Boxmaker 39, no. 1: 15 (January, 1950); Modern Packaging 23, no. 6: 101 (February, 1950).

The new apple carrier designed by the Standard Paper Box Corp., Los Angeles, resembles a soft drink carton, having a handle and separate cells for six large-size apples. Cell cartons of a different design, with cellophane windows in the lid, have been adopted for delicate fruits such as persimmons. 2 illustrations. J.A.B.

ANON. The "Quickmake," an interesting new paper box. Paper Box Bag Maker: 150-1, 159A (October, 1949).

A new one-piece container is described which is erected for use by compressing the ends inward and folding the side flaps over so that they lock into the front and back walls by means of slits and eyes. A conventional hinged lid, with tuck attached, provides the closure. 3 illustrations. J.A.B.

MALCOLMSON, J. D. "Tuf-Bord" . . . stronger cartons for bolts or bottles. Am. Boxmaker 39, no. 1: 18-19 (January, 1950).

The new high-test folding boxboard developed by Robert Gair Co., Inc., New York, has unusual strength and is useful in packaging a great variety of products, such as heavy automotive parts, glass jars, bottles, and jewelry. This new sheet, called Tuf-Bord, has unusually high bursting strength and foldability, and allows the use of lighter calipers, thereby reducing the cost of the package and the freight charges. The material sustains Mullen, tear, tensile strength, and rigidity tests far beyond the usual folding-carton standards, is well adapted to both multicolor and high-gloss printing, and can be sealed with standard automatic packaging machinery. 4 illustrations. J.A.B.

SCHWARTZ, ABRAHAM. The flip-lock spout box. Fibre Containers 34, no. 12: 126, 128, 130 (December, 1949).

A box designed by the author has a pouring spout which can be securely relocked after opening, providing protection against dust, insects, and spilling. The box is cut from one piece of boxboard and has a tab on one corner of the top which, when lifted up, reveals a quarter-round perforated edge. The lifting up of this corner automatically sets up the corner spout,

the other half of which underlies the top half. To close, the corner top tab which was first lifted is inserted between the top side of the spout and the adjoining folded-in side, making a secure protective closure. 8 illustrations. J.A.B.

FORESTS AND FORESTRY

BROWN, A. J. "IPPI" makes good. Am. Forests 56, no. 1: 24-5 (January, 1950).

Independent Pulpwood Producers, Inc., a nonprofit corporation organized by independent pulpwood contractors, has as its goal better forestry practices in Texas and has set out to achieve this by educating forest landowners and operators in proper cutting practices. Real progress has been made in the curbing of clear cutting and the substitution of some form of partial cutting. 3 illustrations. J.A.B.

CARLISLE, KENNETH W. Effects of mechanical logging on reproduction at Mace Bay. Pulp Paper Mag. Can. 50, no. 13: 136, 138 (December, 1949).

The yarding of bunched wood by mechanical means is described and the effect of the system on reproduction discussed. Taking the picture as a whole, it is not expected that the mechanical yarding will do more harm than the present method of logging cut and bunched wood. The disturbance of the moss and exposure of mineral soil in summer yarding may be favorable to the germination of black spruce seeds; yarding on snow does not have this effect, because the soil is not disturbed. The present speculations must be confirmed by later studies of actual conditions, since only two years have elapsed since this work was undertaken. E.S.

COWAN, D. P. Thinning operations in natural stands of jack pine. Pulp Paper Mag. Can. 50, no. 13: 140, 142 (December, 1949).

A large-scale experiment in the silvicultural treatment of jack pine (thinning and brush treatment) in 1925 is described. The diameters of all trees in the sample plots were measured to the nearest tenth of an inch by age classes; the area did not receive further treatment since the original work was done. A remeasurement of all sample plots in 1950 is planned; the data should indicate the best spacing of jack pine for optimum growth and development. E.S.

FLETCHER, H. BOWDEN. Masonite in Australia. Am. Forests 56, no. 1: 22-3, 45-6 (January, 1950).

The Masonite Corp. has prepared a long-term plan for the future of its timber resources in New South Wales, based on the principle of sustained yield by means of regular rotation of forest crops. This plan is confined to the development of native hardwoods and to regeneration through seed and coppice, rather than by planting. The 50,000-acre forest area, when acquired, included three types of sections: one had been denuded of all its millable logs, another was crowded with young growth, and the third was cleared grassland. The first has been cleared, and a system of regeneration has begun; the second has been thinned to assure maximum growth; and for the purpose of restocking the third, a tree nursery is maintained. 3 illustrations. J.A.B.

FORMALDEHYDE

MACKEY, JAY H. The chemical that grows new products. Dupont Mag. 44, no. 1: 24-6 (February-March, 1950).

Formaldehyde, although a neutral substance, is capable of reacting with many types of chemical compounds, and it has been found to be amazingly useful in a great variety of industries, a few of which are mentioned here. Paper manufacturers use formaldehyde to improve the wet strength of paper towels and similar products. 8 illustrations. J.A.B.

FUNGI

PEHRSON, STIG O., and LINDBERG, NILS J. Experience gained in the use of organic mercury compounds for the treatment of wet groundwood pulp during the year 1949. Svensk Papperstidn. 52, no. 22: 560-2 (Nov. 30, 1949). [In Swedish] *cf.* B.I.P.C. 19: 857-8.

The authors review Swedish postwar experiments for preserving wet groundwood pulp by treatment with organic mercurials. The difficult export situation at the beginning of 1949 forced many mills to apply disinfectants to their groundwood pulps stored in Sweden and England; the experience gained to date is discussed. Each of these mills used a white-water system which was not entirely closed. In all untreated bales from different mills red rot and bluing fungi developed, followed by serious discolorations, particularly in the bales stored in England, where climatic growth conditions during the summer were more favorable than usual. On the other hand, even the lowest concentration used (150 g. of BSM-11 B or Pulpasan F per ton of wet pulp—both disinfectants contain phenylmercuric compounds) inhibited the development of red rot and bluing fungi. However, the highest concentration used (250-300 g. per ton) did not produce a sterile pulp, because certain fungi survived the treatment. By removing the less tolerant species, the resistant organisms thrived and were able to develop large colonies, with sterile intermediate areas. These colonies have a violet color and impart a spotty appearance to the pulp. Spectrophotometric whiteness measurements of a sheet made entirely from discolored pulp showed a decrease of 2-3% as compared with a sheet from noninfected pulp. The fungus growing on groundwood has been identified as *Penicillium roqueforti* Thom. (I); the inhibiting concentration of phenylmercuric acetate is about four times that required for *Aspergillus niger* (II). Lower concentrations have a stimulating effect on its growth. Certain other species of *Penicillium* cause a red coloration in wet sulfite pulp. (I) is less tolerant to sodium pentachlorophenate (III); the inhibiting concentrations are 40-60% lower than those needed for (II). (III), however, has a disagreeable odor and complaints have been received when paper was made from pulp treated with the compound, particularly when the pulp had been stored for some time. The heat resistance of (I) has been investigated; complete sterilization of the pulp could be obtained by exposing it to a temperature of 75° C. for one hour. Groundwood pulp subjected to temperatures above 45-50° C. is particularly susceptible to attack by red rot, so that the pulp must be simultaneously treated with an organic mercurial. The toxicity of the mercurials to (I) was found to increase at higher temperatures; sterilization resulted with 2 mg./liter at 50° C. for 30 minutes. The present generally used procedure involves the application of the chemicals immediately before the Kamyr drier; no noticeable loss of disinfectant through dewatering or pressing has been observed. Mercury-tolerant *Penicillium* species and possibly others, such as *Phoma lignicola* (a mercury-tolerant bluing fungus) survive this treatment and may cause later discolorations. The possibility of shock treatments of the system at different intervals should be investigated. The authors recommend experiments with organic mercurials at temperatures of 50° C. and above. In conclusion, brief reference is made to the condition of the treated and untreated pulps stored in England. Attack by red rot and discolorations caused by bluing fungi were frequently encountered in

untreated pulps, even in comparatively fresh bales. The degree of attack by these fungi could be taken as an indication of the temperature at which the pulps had been manufactured. The application of mercurials yielded definite and positive results. E.S.

GASES

NASH, LEONARD K. Gas analysis. Anal. Chem. 22, no. 1: 108-21 (January, 1950).

An extensive review is given of the literature on gas analysis, under the headings: general methods and equipment, including sampling, absorption and adsorption, volumetric procedures, and instrumental procedures; and special methods for specific materials, including oxygen, carbon oxides, nitrogen compounds, sulfur compounds, halogen compounds, hydrocarbons, and other gases. The discussion on the methods of analysis of sulfur compounds is divided into the following subheadings: sulfur dioxide, sulfur trioxide, hydrogen sulfide, total sulfur, and individual sulfur compounds. 358 references. J.A.B.

HEAT

SKAPERDAS, GEORGE T. Heat transfer. Ind. Eng. Chem. 42, no. 1: 62-5 (January, 1950); *cf.* B.I.P.C. 19: 396.

The literature on heat transfer during the past year is reviewed under the headings: general, surface boiling, fluidized systems, compressible flow of air, convection, direct contact convection, condensation and boiling, conduction, service and design data, and miscellaneous. 80 references. J.A.B.

HISTORY

COOPER, R. S. The West owes the East a great debt in the art of ancient papermaking. Indian Print & Paper 15, no. 61: 34 (October, 1949).

The spread of papermaking from China to the West is briefly outlined. E.S.

INDICATORS AND TEST PAPERS

KOLTHOFF, I. M. Indicators. Anal. Chem. 22, no. 1: 65-9 (January, 1950); *cf.* B.I.P.C. 19: 397.

A review is given of the fundamental new contributions in the field of oxidation-reduction indicators, with a brief reference to the literature. The properties of azo dyes as indicators are presented in table form, and several structural formulas are included. 2 tables and 8 references. J.A.B.

INSECTS AND VERMIN

BUTTERFIELD, D. E., PARKIN, E. A., and GALE, M. M. The transfer of DDT to foodstuffs from impregnated sacking. J. Soc. Chem. Ind. 68, no. 11: 310-13 (November, 1949).

A method is described for determining the amount of DDT in foodstuffs, using monoethanolamine to dehydrochlorinate the DDT, followed by electrometric titration of the free chloride with silver nitrate; the monoethanolamine does not hydrolyze the fats and oils. The method has been used to determine the quantities of DDT transferred from DDT-impregnated cotton-twill and jute-twill sacking to wheat, wheat flour, soybean flour, decorticated peanuts, and cocoa beans. The results indicated that relatively large quantities of DDT may be transferred in a few months, particularly to finely divided and fatty foodstuffs. The general conclusion

may be drawn that, to prevent or control insect infestation in temperate climates, whole seeds (wheat and cocoa beans) may safely be stored for at least one year in bags impregnated with up to 1% DDT; whole unprocessed wheat may be similarly stored in bags impregnated with up to 5% DDT, whereas finely particulate or broken materials, especially if fatty (such as wheat flour, soybean flour, and decorticated peanuts), cannot be safely stored for even four months in bags impregnated with 1% DDT. In conclusion, the importance of the vapor-phase transfer of DDT is discussed briefly. 2 tables, 1 figure, and 6 references. E.S.

EVANS, DOROTHY M. The protection of books against insects (A short review of existing methods). Patra Bulletin no. 9. Leatherhead, Printing, Packaging and Allied Trades Research Association, 1949. 9 p. + 4 plates [Confidential to members of PATRA]

The author discusses the types of insects which damage books, chiefly in the tropics, and possible methods for preventing attack and eliminating infestation after it has occurred. The most important factors for the safekeeping of books are clean storage conditions in properly constructed buildings. It is also desirable that books should be made of materials which do not provide food for insects. Some insects can feed on paper alone, but much damage is done by the many different insects feeding on starch paste and glue. With this in mind, it would be a great improvement if books could be bound using nylon thread, synthetic adhesives (such as polyvinyl acetate), and bookcloths made of synthetic materials or plastic treated fabrics. However, as long as the old materials are still being used, a considerable degree of protection is afforded by such recommendations as the Crown Agents for the Colonies Standard Specification, the text of which is reproduced. In conclusion, reference is made to the termite problem. Much work is now being done in many countries to find suitable insecticides or, preferably, repellents, which can be conveniently incorporated into the paper, so that attack by insects can be prevented. 9 figures and 11 references. E.S.

INSTRUMENTATION

MÜLLER, RALPH H. Instrumentation. Anal. Chem. 22, no. 1: 72-8 (January, 1950).

With a discussion of the new components, concepts, techniques, and tentative solutions in the field of instrumentation, descriptions are given of such instruments as photomultipliers, electrolytic thermistors, strain gages, electrometers, and servomechanisms. A review of the literature is given, chiefly of the past year, but some earlier ones are included. 8 figures and 40 references. J.A.B.

WALL, T. P. Instrumentation of black liquor evaporators; Baumé control; and instrumentation of the bleach plant. Pulp Paper Mag. Can. 50, no. 13: 96-102 (December, 1949).

Supplemented by several flowsheets, the author discusses the instrumentation of the black-liquor evaporators, the Baumé controller for holding the thick liquor discharged from the evaporators within very close density tolerances, and the instrumentation in bleach plants for kraft and sulfite pulps. 9 figures. E.S.

INTERIOR PACKING

ANON. B.D.H. introduce a new pack for ampoules, vials and similar articles. Brit. Packer 11, no. 12: 31 (December, 1949).

The basis of the new pack for ampoules, vials, and collapsible tubes, introduced by The British Drug Houses Ltd., is an insert which is punched in one piece from springy board. When correctly folded and inserted in round, oval, square, or rectangular containers, it provides compartments of equal size which grip the articles firmly and give them complete protection. 4 illustrations. J.A.B.

VANANT PRODUCTS INC., *Milwaukee*. New suspension wrap. Fibre Containers 34, no. 12: 118-19 (December, 1949); *cf.* B.I.P.C. 19: 723.

A brief description is given of "Sus-Rap," a new suspension wrap for flat glass or other fragile articles. It consists of three layers of jute or kraft liner with reinforcing slotted teeth protruding from one side. The material to be protected rests within an encompassing frame of the wrapper joined by taping or stitching; it is held securely between the teeth at a distance of about half an inch from the other face. The suspended article is then placed into a corrugated shipping container. 1 illustration. E.S.

IONS

KUNIN, ROBERT. Ion exchange. Anal. Chem. 22, no. 1; 64-5 (January, 1950); *cf.* B.I.P.C. 19: 399.

During the past year, considerable progress has been made in the use of ion exchange as an analytical technique, particularly in chromatography. The author discusses the removal of interfering elements, the determination of concentration, the determination of equilibrium constants and activity coefficients, and the electron exchange resins, with references to the literature. 30 references. J.A.B.

KUNIN, ROBERT. Ion exchange. Ind. Eng. Chem. 42, no. 1: 65-70 (January, 1950); *cf.* B.I.P.C. 19: 399.

The recent literature on ion exchange is reviewed under the headings: reviews, theory of ion exchange, water softening, deionization, separations and concentrations, analytical applications, catalysis, biological applications, and new exchangers. 187 references. J.A.B.

LOADING AND UNLOADING—CARS

SCHROEDER, A. R. Fundamentals of car loading. Fibre Containers 34, no. 12: 108-11 (December, 1949).

In discussing the movement of material by rail, the author emphasizes the need for some knowledge of the construction and behavior of a car in operation and of the fundamentals of car loading and bracing. A car has three basic actions or movements, i.e., lengthwise or horizontal, upright or vertical, and sideways or crosswise. These motions may range from smooth flows of energy to very abrupt shocks. In loading, the major problem is to protect the lading from the horizontal shock first, the vertical next, and the crosswise third, whereas from the standpoint of safety of operation for the railroads, the third or crosswise motion stands in first place. Many serious train wrecks have resulted from the sidewise shifting of heavy commodities within the cars. The importance of correct bracing is pointed out, including type and size of lumber needed, lumber strength, nail holding power, number and strength of steel straps required, etc. Some actual examples are reviewed which show that correct stowing and bracing is an engineering problem which should not be entrusted to just anyone. Calculation and knowledge to the degree necessary for the commodity should be applied to the planning of the container, the load, and the bracing. E.S.

LUBRICATION AND LUBRICANTS

THE TEXAS COMPANY. Electric motor lubrication. Lubrication 36, no. 1: 1-12 (January, 1950).

Directions for the correct bearing lubrication of electrical motors under different conditions are given. 25 figures. E.S.

MACHINERY

ANON. Suppliers to the paper trade. Paper-Maker (London) 118, Annual no.: 14-18, 20-4, 26, 28, 31-2, 34, 36, 38, 42 (1949).

A number of British firms supplying the papermaking industry discuss the progress and developments in machinery and materials made during 1949. Numerous illustrations. E.S.

STANIAR, WILLIAM. Choosing the correct mechanical power transmission method. Tappi 33, no. 1: 67-9A; discussion: 69-70A (January, 1950).

Directions for the correct selection of a mechanical power transmission are given; the methods of the flexible and rigid systems are discussed, with emphasis on the proper understanding of the mechanical and atmospheric conditions involved. The average life expectancy of correctly specified mechanical power equipment is estimated at six years, whereas that of improperly selected equipment is reduced to four years, according to a study covering a number of years in 85 plants of the Du Pont Co. E.S.

MACHINERY—BELTING

COOK, R. E. Leather belting. Southern Pulp Paper Manuf. 13, no. 1: 36 (January, 1950); *cf.* B.I.P.C. 20: 91.

Directions are given for eliminating the objectionable features of stretch, difficulties in fastening, and short life of belts, when power is transmitted from one cone-shaped or tapered pulley to another. 1 diagram. E.S.

HICKS, TYLER G. Getting the most from V-belts. Paper Trade J. 130, no. 3: 29-30 (Jan. 26, 1950).

The troubles with V-belts in typical paper-mill applications are reviewed; directions for their avoidance are given. A well-balanced maintenance program is advocated. 1 table and 2 figures. E.S.

HICKS, TYLER G. Selecting paper mill V-belts. Paper Trade J. 130, no. 3: 35-7 (Jan. 19, 1950).

The different types of V-belts and their construction and operating characteristics are reviewed. The determination of the important service factors of paper-mill drives is illustrated by a typical example and the use of tabulated data. The selection of the proper belts is only the first step toward reliable operation; correct installation and maintenance procedures are equally important. 6 tables and 2 figures. E.S.

MACHINERY—CHIPPERS

ANON. National Container Corporation's new "wood chipper" may improve forest management. Timber Producers Bull. no. 82: 12-14 (January, 1950).

An illustrated description is given of a new chipper unit to be used in the woods; it was developed by the National Container Corp. at Tomahawk,

Wis., and consists of a chipper, engine, structural skid base, pulpwood-rack superstructure, and chipper house. The unit is mounted either on a semitrailer or its own skid base, transported to the operating area, and spotted on landings in the forest, where about 30 to 50 cords of wood salvaged from previous lumber operations are stored. The unbarked sticks are lifted by crane to the rack and are fed manually from the rack to the chipper; the chips are blown by a chip-blower arrangement to semitrailer chip conveyor trucks which haul them to the mill at Tomahawk, where they are unloaded into the mill conveyor system and carried to the chip silo for use in the semichemical pulp mill. The use of rough pulpwood is permissible for the semichemical pulping process; the pulp from these chips is converted into corrugating medium for corrugated shipping containers. The unit has been in operation for a short time only, so that no definite cost data can yet be given; it is expected that the cost of the chips delivered to the mill will be reduced by the equivalent of $1.50 per cord as compared with present methods. 3 illustrations. E.S.

FOBES, E. W. Status of portable chippers. Paper Trade J. 130, no. 3: 31-4 (Jan. 26, 1950).

The types of chipping equipment available today include disk chippers, cylinder chippers, and wood hogs; in addition, hammer mills and shredders also produce wood fragments. Present constructions and factors affecting machine selection are discussed. The feeding of wood to portable and mobile chippers is a major consideration and a phase which has caused the failure of some early machines; several solutions are outlined. The loading of chips by blowers and trough conveyors, the unloading by scoop shovels, dumping mechanisms, or suction equipment, and the transportation by truck or rail are described. In conclusion, production costs and desirable improvements in present machinery are considered. 1 table and 3 illustrations. E.S.

MACHINERY—CORRUGATING MACHINE

ANON. The modern Langston corrugator. Fibre Containers 35, no. 1: 48, 50-6, 61 (January, 1950); Shears 68, no. 685: 43-4 (January, 1950).

An illustrated description is given of the new 78-inch corrugating unit recently installed in the Acorn Corrugated Box Co., Chicago, by Samuel M. Langston Co., Camden, N.J., including the handling of the roll stock, reduction to sheets, and sheet delivery. The single facer produces both "A" and "B" flute boards and is a double-deck unit, eliminating the necessity of two complete sets of roll stands, preheaters, and preconditioning and tensioning devices. The double facer is equipped with belt-tensioning devices, an electric lifting mechanism, and idlers which travel over the heating section; it has 33 feet of heating surface, 29 feet of cooling surface, and heavy-duty drives which will permit extensions at any future date. The new machine is also equipped with 36-inch preheaters, a Reliance variable-voltage drive, a Langston steam and drainage system, and other appropriate features. 6 illustrations. J.A.B.

MACHINERY—DRYERS

ROHMAN, ARTHUR. Auxiliary direct flame booster drying. Paper Mill News 73, no. 4: 14-17 (Jan. 28, 1950).

Reference is made to the increase in the efficiency of the drier section of a Fourdrinier machine in a corrugating-board mill in California through the installation of a gas-fired burner which impinges a direct flame against the wet sheet, just before it enters the steam driers. The sheet is threaded

between two opposing banks of line or ribbon gas burners installed between the second press and the first steam drier. The burner raises the web temperature from 75 to 180° F. in a little over two seconds. A direct flame can be applied to the wet paper without injury to the product, because the temperature of the paper at this stage cannot exceed 212° F. and its kindling temperature is 375° F. About 50% of the moisture is removed from the web on the Fourdrinier wire, 15% in the wet presses, and 10-15% by the gas burners, so that the sheet enters the steam-drier section (28 rolls) with a moisture content of 20-25%. The burners are designed for a combination oil-gas system; kerosene is used as a substitute fuel during the winter. The details of the burner equipment and the operation of the 9-point corrugating mill are described. The burner installation has increased the plant's capacity from 15 to 18% daily. 5 figures. E.S.

MACHINERY—ELECTRIC EQUIPMENT

BARTLETT, GUY. Electrical and allied developments during 1949. Gen. Elec. Rev. 53, no. 1: 11-52 (January, 1950); *cf.* B.I.P.C. 19: 401.

A general illustrated review of all phases of electrical developments during 1949 is presented; the section on "Paper" on page 30 covers the beta-ray gage and a simple tensiometer for holding the tension of a paper web on the machine constant, regardless of variations in drying, machine loading, or stock conditions. E.S.

MACHINERY—FELTS

WOODSIDE, L. M. Relation of a maintenance program to felt operation. Fibre Containers 34, no. 12: 112-15 (December, 1949); Paper Trade J. 130, no. 6: 26, 28, 31 (Feb. 9, 1950); *cf.* B.I.P.C. 19: 635.

This is essentially the same as the previous reference. J.A.B.

MACHINERY—FILTERS

MILLER, SHELBY A. Chemical filters—many types meet industry's varied demands. Chem. Inds. 66, no. 1: 38-48 (January, 1950).

A review is given of the important types of filters employed by the chemical process industries, with references to their fields of use and limitations, as well as the recent developments in this field. The types of cake filters discussed include: pressure, gravity, horizontal pressure, pressure leaf, continuous pressure, vacuum, batch vacuum, vacuum drum, vacuum disk, and continuous horizontal vacuum filters, as well as filter presses. Clarifying filters, which are used to separate liquid mixtures containing only very small quantities of solids, include disk filters and plate presses, precoat pressure filters, cartridge clarifiers, and other miscellaneous clarifiers. Instructions are given for selecting filters, filter bases, and filter aids. Manufacturers of cake and clarifying filters, clarifying cartridge filters, and magnetic clarifiers are tabulated. 3 tables, 10 illustrations, and 14 references. J.A.B.

MILLER, SHELBY A. Filtration. Ind. Eng. Chem. 42, no. 1: 52-5 (January, 1950); *cf.* B.I.P.C. 19: 403.

A review of the literature on filtration for 1949 is presented, although some earlier references are also included. 100 references. J.A.B.

MACHINERY—MIXING APPARATUS

RUSHTON, J. HENRY. Mixing. Ind. Eng. Chem. 42, no. 1: 74-6 (January, 1950); *cf.* B.I.P.C. 19: 403-4.

Recent developments are reviewed under the headings: mixing with jets, shaking autoclaves, effect of agitation on mass transfer, gas absorption, and equipment for mixing liquids. 2 illustrations and 8 references. J.A.B.

MACHINERY—PIPING

DICKSON, R. A. Pipe cost estimation. Chem. Eng. 57, no. 1: 123-35 (January, 1950); *cf.* B.I.P.C. 19: 636.

The author describes in summary and somewhat different form the data on pipe cost estimation using the "N" system developed by him which will appear in the forthcoming book "Industrial piping," by C. T. Littleton and R. A. Dickson, to be published by McGraw-Hill in 1950. The author claims that piping costs may be estimated accurately and more easily in this manner than by conventional methods. 3 tables and 40 diagrams, showing 66 "N" factor tabulations (some grouped) for different construction materials. E.S.

ZIEGENBUSCH, CARL W. Asbestos cement pipe for overhead piping systems. Tappi 33, no. 1: 25-8 (January, 1950).

Following a brief description of the manufacture of asbestos-cement pipes, the author discusses their application to overhead piping systems, suitable couplings and fittings, and installation methods, including bracing and alignment practices. Reference is made to the satisfactory results obtained by the Chillicothe Division of the Mead Corp. with these pipes. The importance of a tight fit of the flange, the careful avoidance of strains, and the need for adequate bracing of the system are stressed. Asbestos-cement piping should not be considered where the pH of the conveyed material falls below 4.5, where temperatures exceed 175° F., or where the pipe line may be subject to severe, unavoidable external shocks. 4 figures. E.S.

MACHINERY—PRINTING MACHINE

DAVIS, E. B. Rubber rollers vs. composition rollers in carton and box board printing. Shears 68, no. 685: 22-4 (January, 1950).

Although synthetic rubber rollers are gaining in popularity, especially since softer compounds have been developed, by far the greater percentage of carton companies prefer the rubber-base, composition-coated rollers for use in their pressrooms. Hours of resetting time are saved, because the natural rubber base does not change in size, and composition coatings can be quickly applied, to meet seasonal changes. The factors which will influence the selection of the most suitable roller equipment include: type of printing equipment and speed of operation, type of paper or board stock used, type of ink, and type of craftsmen available in the plant; of these items, ink is the most important. Linseed-base and moisture-set inks and their effect on rollers are discussed. 3 illustrations. J.A.B.

MACHINERY—PULPERS

HORSLEY, J. Some modern American stock preparation units. Paper-Maker (London) 118, no. 6: 416, 418, 420-2 (December, 1949).

The construction and mode of operation of the Hydrapulper, the modern

Stockmaker, the Classifiner, and the Stapley pulper are described. 3 tables, 1 diagram, and 2 references. E.S.

MACHINERY—WAXING MACHINE

LATIMER, ROBERT. Method of wax impregnation. Am. Paper Converter 24, no. 1: 27 (January, 1950).

An unusual electrical heating machine has been developed by the Cupples-Hesse Corp., St. Louis, for impregnating paper cups with paraffin wax for use in the packaging of ice cream and liquid products. A conveyor belt first dips the cups into liquid paraffin heated by immersion heaters, carries them past a row of six strip heaters to melt off the extra coats of paraffin, and then moves them to a level where 28 infrared heat lamps literally bake the thin film of paraffin into the fibers of the paper. A production of 50,000 units per day can be attained by the machine. J.A.B.

MATERIALS HANDLING

ANON. Pulpwood handling at Wood Conversion Company. Paper Trade J. 130, no. 1: 32 (Jan. 5, 1950).

The wood- and chip-handling facilities at the new chipping mill of the company at Cloquet, Minn., are outlined briefly. The mill is handling up to 40 cords of pulpwood per hour with a crew of only six men. 6 illustrations. E.S.

CARLSSON, SIMON. Materials handling in the wallboard industry. Svensk Papperstidn. 52, no. 21: 526-8 (Nov. 15, 1949). [In Swedish]

The author discusses the problems connected with the transportation of the necessary raw materials, the handling during manufacture and storage, and the shipment of the finished products to the consumer as they apply to Swedish wallboard mills. Since Sweden exports approximately 30% of its annual wallboard production of 235,000 metric tons, the handling and shipment by truck, rail, or boat must find satisfactory solutions. Wallboard is a more delicate, finished product, so that the methods used for the transport of wooden boards cannot be adopted. Palletizing offers definite possibilities, and the present status of the standardization program for Swedish freight pallets is discussed. Norway and Finland have already adopted the same standard pallet size (48 × 32 inches, with double bottom), whereas Denmark is still waiting for the results of some investigations. As far as wallboard is concerned, the standard pallet can only be used for the smaller sizes and special pallets must be developed for the larger boards. E.S.

HUDSON, W. G. Pneumatic conveyors solve many unloading problems. Industry and Power 57, no. 5: 81-3 (November, 1949).

The solution of several difficult materials-handling problems by pneumatic conveyors is described, including, among others, the transportation of shredded lap pulp by a pneumatic conveyor duct from the shredder to the storage room, and a suction-pressure system for transferring soda ash from the car to either the service bin or to storage. 1 illustration and 5 diagrams. E.S.

MACKENZIE, RICHARD STEELE. Material handling economies in pulp and paper mills. Paper Mill News 73, no. 3: 42, 44, 46 (Jan. 21, 1950).

The types of handling methods in pulp and paper mills are enumerated;

they show that the industry is fully aware of the possibilities of the more advanced handling techniques. Reference is made to current trends or possibilities, particularly in southern woods operations. Materials handling represents a field of immense potentialities for savings and increased profits through better methods, labor-saving devices, and mechanization; yet top management must demonstrate its highest degree of judgment and foresight to see that expense is kept under control, that each item is making a profit, where possible, and that the installations are not overdone to the point of inflexibility. E.S.

SCHNYDER, A. P. Material handling of pulpwood. Paper Mill News 73, no. 3: 28, 30, 32, 76 (Jan. 21, 1950).

Wood transportation and storage in northern, western, and southern mills are described. The removal and handling of bark in newsprint and kraft mills is discussed. 5 figures. E.S.

WRIGHT, ROBERT E. Materials handling. Ind. Eng. Chem. 42, no. 1: 70-3 (January, 1950); *cf.* B.I.P.C. 19: 406.

The recent literature is reviewed under the headings: liquid and gas handling, solids handling, and miscellaneous materials handling devices. 9 illustrations and 38 references. J.A.B.

MICROSCOPY

MARTS, RALPH O. Application of fluorescence microscopy and photomicrography to woody tissues. Stain Technol. 25, no. 1: 41-4 (January, 1950).

A procedure is described by means of which preparations of woody tissues were made for visual observation or photography by incident-light fluorescence microscopy. Specimen blocks of fresh or preserved material were placed in a small glass dish, oriented in loosely crumpled aluminum foil, and immersed in a beaker of distilled water or 70% alcohol. The unit was then placed in a low-pressure vacuum chamber until the air was evacuated. The surface of the specimen was leveled to the side of the dish, the liquid was lowered with a pipette to just below the surface of the specimen, and a cover glass was placed on top to avoid bubbles and prevent surface drying. A special microscope and a photomicrographic base were used for examination and photography of the specimens. Among the advantages claimed for the method are the possible examination of relatively larger surface areas of wood blocks than by usual methods and marked color contrast without the use of stains; improved color contrast can be obtained by the use of Congo red. 1 illustration and 3 photomicrographs. J.A.B.

MICROSCOPY (ELECTRON)

HAMM, F. A. Electron microscopy. Anal. Chem. 22, no. 1: 26-30 (January, 1950); *cf.* B.I.P.C. 19: 407.

Following a brief discussion of the recent progress made in electron microscopy as an applied science, a literature review is given for 1949, under the headings: instruments, applications, specimen preparation, electron diffraction, foreign developments, and future developments. 86 references. J.A.B.

MILL CONSTRUCTION

CELLI, M. C. Modern paper mill buildings. Tappi 33, no. 1: 1-10 (January, 1950).

The best contemporary design of all the component parts of paper mill

buildings uses "fitness for purpose" as a common denominator. The processes of equipment operation and building design are inseparable and indispensable. Paper mill buildings represent 20 to 25% of the total project cost. Today they are no longer simple enclosures of space; in order to develop the utmost potential in production, they must provide the best physical environment for each machine and for each individual. The design components of buildings must provide this environment—the structural frame, the walls, the roof, the acoustics, the lighting, the use of color, and the internal atmosphere. There is a new emphasis on better employee facilities. An analysis is given of floors and the floor-drainage problems with remarks on the corrosion of concrete and masonory caused by fumes and solutions. A study of a semi-open recovery building is presented. Suggestions are made for saving some maintenance costs on buildings with plates detailing eight typical wall sections and eight roof sections, together with a structural and functional analysis of each. 7 figures. E.S.

RENARD, A. The problem of building or modernizing a paper mill. Papeterie 71, no. 12: 485, 487, 489, 491 (December, 1949). [In French]

By citing the example of a one-machine paper mill which makes 18 tons per day of various fine papers from purchased bleached and unbleached pulps, the author shows that under present French conditions a better return of the investment may be expected from the modernization of an existing mill than from the construction of a new unit. E.S.

MILL MANAGEMENT

CLAPPERTON, R. H. Managing a paper-mill. Paper-Maker (London) 118, no. 6: 409-12, 414 (December, 1949).

The management of a medium-size mill is discussed, which is under the control of a manager who is a papermaker and who is capable of taking the entire responsibility for the running of the mill from every aspect. The importance of co-operation between papermaking, engineering, and laboratory staffs, and cost department is stressed, as well as the essential part played by the foremen. Continuity of labor should be fostered and every encouragement given to the men who have worked in the mill to allow their sons to come in and be trained as papermakers. The whole object of good management is to obtain the right spirit of co-operation from everyone in the mill; the best discipline will prevail where there is good feeling without threats of punishment and dismissal. Working conditions, the maintenance of necessary records, and committees useful in helping with the management of a mill are also considered. E.S.

HYDE, ARTHUR D. What management expects of packaging. Fibre Containers 34, no. 12: 132, 134, 136-9 (December, 1949).

Management in general expects packaging to accomplish three broad objects: salesmanship, plus the ability to give complete consumer satisfaction; protection for its products during their market life; and reduced distribution cost. Today, packaging has become a top-management problem. Management need not be involved in the technical details of packaging, but should supply the basic decisions, i.e., its marketing aims, scope, and budget. E.S.

MUCILAGE

HOUGH, L., JONES, J. K. N., and HIRST, E. L. Chemical constitution of slippery elm mucilage: isolation of 3-methyl D-galactose

from the hydrolysis products. Nature 165, no. 4184: 34-5 (Jan. 7, 1950).

The separation and identification of the hydrolysis products of the mucilage obtained from the bark of the slippery elm tree was attempted by use of paper partition chromatography. Separation on a column of cellulose, using a mixture of 95% *n*-butanol and 5% ethanol, nearly saturated with water, as the mobile phase, yielded pure crystalline specimens of D-galactose, L-rhamnose, and 3-methyl-D-galactose. The 3-methyl-D-galactose was identified by its position on the paper chromatogram, an x-ray powder photograph of its crystals, and the change in optical rotation of its solution in 4% methanolic hydrogen chloride from a positive to a negative value. 10 references. J.A.B.

ODORS

CROCKER, E. C. Odor classification; is it possible without a valid theory of odor? Chem. Eng. 57, no. 1: 237, 239-41 (January, 1950).

The author takes the affirmative side in this discussion, claiming that it is possible to obtain an effective system of odor classification in the absence of a valid theory of odor. Reference is made to the possibilities of the Crocker-Henderson system which, although admittedly still imperfect, is primarily useful for training beginners. The use of this system by many different parties is suggested and their contributions for improvements are solicited as a means for advancing the present knowledge of odor. E.S.

PROCTOR, B. E., and KENYON, E. M. Objective evaluation of odor deterioration in orange oil. Food Technol. 3, no. 12: 387-92 (December, 1949).

The development of so-called "terpeney" odors in citrus oils, brought about by air oxidation, has long been a problem in the food industry. In an attempt to place the evaluation of odor deterioration in citrus oils on a reproducible, objective basis, orange oil (as a representative citrus oil) was studied by several techniques. A standard Warburg manometric system was used to measure the quantity of oxygen absorbed by the oil under controlled conditions. Changes in the infrared absorption spectra of the samples were studied to follow the chemical changes during oxidation and to suggest possible reaction products. Calibrated odor panels employing the method of paired comparison gave data on the quantity of oxygen necessary to produce "terpeney" odors. It is believed that such a combination of physical and organoleptic techniques may afford a new approach to the important field of odor evaluation, not only for essential oils but for many foods and food components. 3 tables, 8 figures, and 15 references. E.S.

SAGARIN, EDWARD. Odor classification; is it possible without a valid theory of odor? Chem. Eng. 57, no. 1: 237-8 (January, 1950).

The author assumes the negative viewpoint in this discussion. Odor classification involves the grouping of different odorous substances or stimuli according to a qualitative similarity or affinity among them. A valid system is unattainable as long as it is based exclusively on sensory impressions of individuals, as in the past. To date, all systems have proved to be and will continue to be irreproducible, unless based on a sound and proved theory of odor which will establish the nature of the olfactory stimulation. E.S.

PAPER—COATED

CALLAHAN, T. PAT. Polyethylene's star on rise as packaging lining material. Chem. Inds. 66, no. 1: 102 (January, 1950).

The development of polyethylene-lined multiwall bags, as well as liners of polyethylene laminated to paper, fiberboard, and textiles, makes available a material with ideal properties for packaging a wide variety of chemical products. Polyethylene coating is odorless, nontoxic, moistureproof, and flexible at low temperature, and its ability to be heat sealed in a case, bag, or drum recommends it as a lining for hygroscopic materials. It also strengthens the sheet to which it is applied, is substantially unaffected by acids and alkalies, and provides an excellent grease and oil barrier. Multiwall bags with polyethylene liners are now available, and considerable work is being done to develop liners for other types of packages. 1 illustration. J.A.B.

NEWBERG, R. G. Polyethylene-polyisobutylene blends. Modern Packaging 23, no. 5: 121-4, 172 (January, 1950).

It has been found that polyethylene, the plastic material with so many packaging applications, becomes even more versatile when blended with polyisobutylene, enabling it to be used in packaging fields where it is now inapplicable or, at best, marginal. These polymers are completely compatible, although they possess different physical and chemical properties. In an investigation of such blends, tests were made to determine tensile strength, elongation, brittleness, tear strength, gas and water-vapor permeability, chemical resistance, heat sealability, and processing. Polyethylene (Du Pont PM-1) was used as the base resin, with polyisobutylenes B-80, B-120, and B-260 as the plasticizers; to 100 parts of this blend was added 0.25 part of Deenax (a nonstaining, nontoxic inhibitor), 1 part of stearic acid, and 2 parts of microcrystalline wax (melting point 190° F.). Results of these tests are shown in graph and table form. 7 tables, 3 graphs, and 3 references. J.A.B.

STILBERT, E. K., VISGER, R. D., and LALK, R. H. Aging of styrene-butadiene latex modified starch-clay coatings. Tappi 33, no. 1: 16-22 (January, 1950).

Mineral pigment-coated papers were prepared in the laboratory with the type of adhesive as the principal variable and the pigment blend as a secondary variable. Clay and a blend of clay and calcium carbonate were used with starch and starch blended with Dow Latex 512K, a styrene-butadiene copolymer, to study the effect of normal aging on the properties of the coated papers. During a period of 15 months of normal aging the brightness and ink receptivity of the papers changed at the same rate in all cases. Both the ink-pick and the wet-rub resistance of the coated papers containing the latex improved with aging; the greatest increase was obtained with the highest proportion of the copolymer. The flexibility of the coated papers and the retention of flexibility with aging increased directly in proportion to the increase in the proportion of the latex in the adhesive. These results were found to be comparable to the effect of normal aging on commercially prepared coated papers containing the copolymer. 3 tables, 10 figures, and 6 references. E.S.

PAPER AND PULP INDUSTRY

ARIES, ROBERT S., and COPULSKY, WILLIAM. The market for dissolving wood pulp. Paper Trade J. 130, no. 2: 29-33 (Jan. 12, 1949); Pulp Paper Mag. Can. 51, no. 2:47-51, 120 (February, 1950).

Statistical data for the consumption of dissolving pulp in the United States are given. Of the 647,000 tons of dissolving wood cellulose available in the United States in 1948, the rayon industry alone consumed 435,000 tons. Only a negligible amount was consumed by the producer; almost the entire production was sold. However, large consumers are starting their own

production, so that the open market for dissolving pulp in the United States is decreasing. It is estimated that world consumption and production will balance until 1955, at which time a surplus is predicted for North America and Europe and a deficiency for Latin America and southeast Asia; both are suffering from a shortage of the proper type of wood to be converted into dissolving pulp. The expected surplus in the United States and Europe should be able to supply this deficiency, provided that the assumptions made in this forecast prove to be correct. 6 tables. E.S.

LEWIS, HARRY F. Pulp and paper production drops. Chem. Eng. News 28, no. 1: 23-4 (Jan. 2, 1950).

The over-all decline in the production of pulp and paper in 1949, as compared with the all-time high in 1948, is illustrated by statistical figures. One of the most pressing problems in the industry during the past year has been that of trade waste elimination and disposal; two important moves have been made toward the elimination of this problem. The first is a new plant at Rhinelander, Wis., for the production of the yeast *Torulopsis utilis* from sulfite waste liquor, leaving a yeast-free effluent with 90 to 95% of the hexose and pentose sugars removed and freed of nearly all other organic materials which contribute to the biochemical oxygen demand. The second is a Weyerhaeuser plant at Longview, Wash., in which magnesium bisulfite is used as the pulping chemical instead of calcium bisulfite, the object being the recovery of both magnesium and sulfur during evaporation and the incineration of the waste liquors to recover magnesium oxide and provide heat for the boilers. Another field of interest in 1949 has been the preservation of an adequate supply of wood. A policy of utilizing available wood species of all kinds has been adopted by paper mills, and there have been many attempts to increase the amount of wood recovered from a given area of woodland. Improved methods of harvesting, greater use of waste wood through integrated operations, and conversion from chemical processes to semichemical processes to increase the yield of pulp per digester and per unit of wood have contributed to this cause. Other developments in the industry during 1949 are summarized. J.A.B.

POULIOT, L. J. Canada's pulp and paper industry—1948. Pulp Paper Mag. Can. 50, no. 13: 72-7 (December, 1949); Newsprint Service Bur. Bull. no. 382: 2-3, 6 (November, 1949); *cf.* B.I.P.C. 19: 410.

This article is a slightly condensed version of the annual statement by the Department of Trade and Commerce, Dominion Bureau of Statistics, Census of Industry, Forest Products Statistics for 1948. The manufacture of pulp and paper has been consistently one of the most important industries in Canada during the last 34 years. In 1948, it again surpassed the many records it has established in previous years. The gross value of products reached $825,857,664, or 16.8% higher than in 1947. The 88 mills making paper produced 6,063,646 tons of paper and board, an increase of 5% in tonnage. Newsprint accounted for 76.5% of the total; the increase amounted to 3.7%. The production of all other kinds of paper also showed increases. The province of Quebec leads in the manufacture of paper with 53.4%, Ontario with 30.3% is second, and British Columbia with 7% third, followed by New Brunswick, Nova Scotia, and Manitoba, which together account for the remaining 9.3%. Exports of wood pulp amounted to 1,797,998 tons (6.4% increase), and exports of newsprint totaled 4,328,084 tons (2.5% increase). The value of paper and paper goods imported in 1948 was $17,212,565, a decrease of 25% as compared with 1947. Eleven tables are included covering detailed statistics for 1947 and 1948 on production, ex-

ports and imports, raw materials used, etc. One chart, showing fluctuation in national income and variations in pulp and paper production, is also given. E.S.

ROWE, R. C. A review of British industry. I. Its relationship to Anglo-Canadian trade. Pulp Paper Mag. Can. 50, no. 13: 71, 77-8 (December, 1949).

The author discusses the problem of the "dollar gap" and the reason why the "Atlantic Trade Triangle" no longer works in a world of complete productive unbalance. The possible consequences of these conditions are mentioned, with particular reference to their repercussions in Canada. E.S.

SMITH, F. W. Paper in South Africa now and in the future. Pulp & Paper 24, no. 1: 66, 68, 70 (January, 1950).

Following a brief outline of the general social and political conditions in South Africa, the status of the printing and paper industries is described. The curse of South Africa is an erratic rainfall which causes great loss and lack of water. The few existing paper and board mills are briefly discussed; conditions in the paper market are reviewed. The South African paper buyer is a keen buyer and one who has been accustomed to buying from any world source offering the best quality and lowest price. In the past, South Africa purchased large quantities of paper and board from Scandinavia. These qualities were well liked, packing was excellent, and prices were lower than English, American, and continental European sources. However, Scandinavian prices have recently risen to such levels that South African buyers have turned to the United States and Canada for tonnage of many grades. It is practically impossible to secure any reliable statistics on the importation or consumption of paper in South Africa, because the offices of the Commissioner of Customs in Pretoria are about two years behind in compiling these figures. 4 illustrations. E.S.

PAPER AND PULP INDUSTRY—EDUCATION

ANON. Industry aids Western Michigan. Paper Trade J. 130, no. 2: 20-1 (Jan. 12, 1950); Pulp & Paper 24, no. 2: 54 (February, 1950); *cf.* B.I.P.C. 20: 257.

A list of contributors to the new pulp and paper laboratories at McCracken Hall, Kalamazoo, is given. 6 illustrations. E.S.

ANON. A visit to Maine University, cradle of industry's technical training. Pulp & Paper 24, no. 1: 54, 56 (January, 1950).

Reference is made to the Department of Industrial Co-operation at the University of Maine which represents an attempt to foster and develop research in co-operation with industrial companies. The activities and facilities of the pulp and paper division are described. 5 illustrations. E.S.

FAIR, A. E. H. What about education & training. Pulp Paper Mag. Can. 50, no. 13: 78-80 (December, 1949).

The author stresses the need for and importance of industrial training in the pulp and paper industry, where conditions have radically changed during the last 25 years from a rule-of-thumb method to a technically controlled process. Senior operators should be educated first; any plan and educational program should include union officials and have their support. Some of the subjects included in training programs should cover: the process from beginning to end, with particular stress on the end use of the product, the financial and functional organization of the company, and current events

which have a bearing on industry and company welfare. The fact must be understood and accepted that promotion cannot be based on seniority, but must go to those who are properly trained and educated for the job, and that without efficiency, no company can stay in business. The need for training and education is management's responsibility; it is a challenge which must be accepted. E.S.

PAPER AND PULP MILLS

ANON. Additions at Quebec City: new board machine, boiler and Stacomizer. Pulp & Paper 24, no. 1: 58 (January, 1950).

Improvements at the Anglo-Canadian Pulp and Paper Mills near Quebec include a new Combustion Engineering Co. boiler using pulverized fuel and a Stacomizer, a new type of bark press, incorporating a new fundamental mechanical principle which permits the continuous application of high pressures without destructive heat. The company expects to press about 85 tons of bark daily on a bonedry basis with this new unit, which will begin to operate when the wood drive starts next spring. 1 illustration. E.S.

ANON. Visit to Iroquois Falls; many improvements seen. Pulp & Paper 24, no. 1: 38, 40 (January, 1950); *cf.* B.I.P.C. 20: 317.

An illustrated description of recent innovations at the newsprint mill of the Abitibi Power & Paper Co. at Iroquois Falls, Ont., is given, with particular reference to the new groundwood mill. E.S.

THE BENGAL PAPER MILL CO., LTD. Diamond Jubilee, 1889-1949. Indian Print & Paper 15, no. 61: 29-32 + 2 plates (October, 1949); *cf.* B.I.P.C. 20: 332-3.

A history of the company and a description of mill installations and technical developments are presented. 3 illustrations. E.S.

TODD, W. L. An old mill with a new look. Pulp Paper Mag. Can. 50, no. 13: 82-95 (December, 1949).

Following a brief history of the Murray Bay, Que. mill of Donohue Brothers Limited, a detailed description of the modernization program of the groundwood and paper mills is given. In the grinder room, six new Waterous Great Northern grinders, two Haug refiners, three lithcoted Cowan screens, and 10 Sherbrooke deckers with the necessary auxiliaries replaced obsolete equipment. In the paper mill, the two Fourdriniers were thoroughly overhauled and revamped, and the old Ferguson drive replaced by an electrical sectional Harland drive. The electrical power system and steam plant were modernized in accordance with the power demands of the new machinery. Numerous illustrations, including two flowsheets of the groundwood-mill layout and the paper-machine systems, are included. E.S.

PAPER MANUFACTURE

ANON. The romance and utility of paper; a general reference for users of papers and boards. Part 3. Paper Making and Paper Selling 68, no. 3: 19-20, 62 (1949); *cf.* B.I.P.C. 20: 267.

The steps involved in papermaking are traced from the time the rags, esparto grass, straw, or wood reach the mill to the time the finished sheets are sorted and stacked. The methods of making paper both by hand and by machinery are described. J.A.B.

PAPER SPECIALTIES

ANON. Chemical-coated paper makes anti-rust wrapper. Can. Pulp Paper Ind. 2, no. 12: 13 (December, 1949); *cf.* B.I.P.C. 19: 155.

With reference to the vapor-phase inhibitor developed by the Shell Development Co., the manufacture of this chemically treated paper by the Canadian licensee, Canada Glazed Papers Limited, Toronto, is briefly outlined. The paper base is either kraft or kraft waterproofed with asphalt; the VPI coating, a slurry composed of several chemicals and an adhesive, is applied by means of an air-brush coater. The temperatures in drying must be carefully controlled. E.S.

ANON. Packaging paper products. Modern Packaging 23, no. 5: 85-9 (January, 1950).

With the recent trend toward the year-round use of paper plates, napkins, and table covers, producers have found it necessary to speed up production, and this has been accomplished by almost complete mechanization of packaging operations. Sutherland Paper Co. and Beach Products, Inc., both of Kalamazoo, have pioneered in the field of automatic packaging of paper tableware; their operations are described in some detail. In the wrapping of paper napkins, for example, cellophane is cut by machine to the proper length and wrapped around an automatically counted stack of napkins, the ends are heat sealed, and labels are applied, maintaining a wrapping speed of 44 packages per minute. 10 illustrations. J.A.B.

ANON. Printers' paper problems. IX. Writing papers. Indian Print & Paper 14, no. 60: 44 (July, 1949); *cf.* B.I.P.C. 20: 334.

Writing papers are usually more carefully made than printings; they have a closer and finer texture and are more heavily sized to provide a good writing surface. The best grades are tub sized. Printing inks, on the other hand, cannot dry by penetration into the tub-sized paper and have to dry entirely by oxidation with the resulting tendency to set off. Hence, different inks are required for the cheaper engine-sized grades and the better grades of tub-sized writings. The special printing demands of cream laid and wove writings for folders and brochures, banks, bonds, and parchments for commercial stationery, tinted bonds, tub-sized rag papers, and loose-leaf ledger paper are briefly outlined. E.S.

DOW CORNING CORPORATION. Water-repellent, non-adhesive surfaces on paper with silicone fluid. Chem. Processing Preview 13, no. 1: 16 (January, 1950); Paper Ind. 31, no. 10: 1246, 1248 (January, 1950).

DC 1107 is a colorless, odorless, noncorrosive silicone fluid which can be applied to paper from a solvent solution or water emulsion by dip or roller coating. Treated papers become water repellent and nonadhesive to rubber, asphalt, pressure-sensitive tapes, and most adhesives. Hard-sized papers are more economical to treat than slack-sized stock. Treated papers are recommended for use as interleaving sheets for uncured rubber stock, pressure-sensitive tapes, adhesive and friction tapes, and for shipping bags for asphalt, etc. E.S.

HAMILTON, WALKER, JR. Anti-tarnish and anti-rust papers. Paper & Twine J. 23, no. 11: 11, 28 (January, 1950).

The difference in the uses and manufacture of antitarnish and antirust

papers are pointed out. Antitarnish tissues, useful for wrapping silverware, brassware, etc., are made of paper which is relatively free of reducible sulfur, such as rag, kraft, and sulfite. Antirust papers are generally made of kraft pulp and given a maximum wash, in order to eliminate as many harmful salts and acids as possible; these are used for wrapping iron and steel products. J.A.B.

KAINER, FRANZ. The use of polyvinyl chloride in the packaging industry. Kunststoffe 39, no. 7: 165-8 (July, 1949). [In German]

The different applications of polyvinyl chloride in the packaging industry are reviewed; they include: the lacquering of paper, board, jute, iron plate, etc.; laminations to paper, board, and metal foils; the impregnation of fabrics for the manufacture of bags; the molding of containers from mixtures of fibrous suspensions and dispersions or emulsions of the polymer; the manufacture of plastic films and small containers therefrom; and different closures and closure liners for bottles, jars, etc. The advantages of the polymers or mixtures containing them are high chemical resistance, nontoxicity, freedom from odor and taste, permanence on aging, and low water-vapor permeability. 2 tables and 55 references, chiefly to patents. E.S.

M. A. The manufacture of photographic papers for industrial purposes. Papeterie 71, no. 10: 389, 391, 393, 395, 397, 399; no. 11: 445-7 (October, November, 1949). [In French] *cf.* B.I.P.C. 20: 105-6.

The requirements for the raw stock and the coating process for the different kinds of sensitized papers (tracing, blueprint, diazotype papers, etc.) for industrial purposes are outlined. Special reference is made to the Ozalid process (*cf.* B.I.P.C. 20: 25). 2 diagrams. L.E.W.

MINNESOTA MINING AND MANUFACTURING COMPANY. Imbedded glass filaments reinforce tape like steel rods in concrete. Packaging Parade 18, no. 204: 75 (January, 1950); *cf.* B.I.P.C. 20: 238.

A new pressure-sensitive, heavy-duty tape, made with thousands of parallel glass filaments running lengthwise for reinforcement, is a recent development of the company. This tape, called "Scotch" brand filament tape No. 890, has a tensile strength of 500 pounds per inch of width and a minimum of 6% stretch. It insures a tamperproof seal and is especially valuable for reinforcing paperboard containers, banding shipping cases onto pallets, and bundling steel pipes and coils. The new tape will be available in 72-yard rolls of ½-, ¾-, and 1-inch widths. 8 illustrations. J.A.B.

MODERN PACKAGING. The year ahead. Modern Packaging 23, no. 5: 73-7, 168, 170 (January, 1950).

After a prolonged period of scarcity during and following the war, packaging materials are once again available in adequate quantities, and the outlook for 1950 is very favorable. No predictions are made as to the probable price trends, but it is noted that increased productive efficiency and improved processes will tend to offset increased cost of labor and raw materials. The various packaging materials, such as offset paper, glassine and greaseproof paper, waxed paper, unbleached kraft, fancy paper, steel, aluminum foil, lead, brass, cellophane, rubber, adhesives, and plastics, are considered separately, and their production both for the past year and for the following year are discussed. Current inventory practice is summarized in table form,

and another table indicates the percentage change in production of containers from 1948 to 1949. 2 tables and 5 illustrations. J.A.B.

NAZZARO, RALPH T. Theory of saturation of paper with resin. Tappi 33, no. 1: 23-5 (January, 1950).

There are many problems involved in the saturation of paper with synthetic copolymers which, in addition to wetting and spreading, involve intermolecular electronic forces between solute and solvent, and between the residing polar groups of cellulose and the solute-solvent. These and other factors are discussed briefly in regard to the treatment of paper with a resin or rubber latex. 4 references. E.S.

PAPER SALES. Jewelry stores . . . the market that's really different. Paper Sales 10, no. 1: 9-10, 36 (January, 1950).

One of the most interesting and distinctive types of markets visited by the paper salesman is the jewelry store, where antitarnish papers and tissues, fancy paper doilies and gift boxes, and special-design wrapping papers constitute the majority of the merchant's needs. The volume of sales is not great, but the jeweler is a regular buyer of small quantities of merchandise in quality brackets, which means dollars without bulk. 3 illustrations. J.A.B.

PAPER SALES. Toilet seat covers—growing demand makes them a lead item. Paper Sales 10, no. 1: 12-13, 15, 33-4 (January, 1950).

The wide acceptance of toilet-seat covers gives the paper salesman the opportunity to expand his sales and increase his profit; those customers who formerly bought paper towels and toilet tissue are the best prospects for this commodity, since the three products go hand in hand. In a series of questions and answers, information is given concerning the construction, production, sizes, design, cost, and packaging of toilet-seat covers, and the types of dispensers used. 4 illustrations. J.A.B.

STANDARD INSULATION CORPORATION, *East Rutherford, N.J.* New aluminum foil-backed wrapping paper for vapor tight packaging of new and spare parts. Packaging Parade 18, no. 204: 84 (January, 1950).

Stanwrap No. 40 is made by laminating aluminum foil to the reverse side of specially coated kraft paper, thus making it waterproof, highly scuffproof, and resistant to oils, greases, mild alkalies, and acids. No waxes, tapes, or heat are necessary to seal this wrapping paper, since a vapor-tight package can be obtained by merely twisting the ends of the wrapping. This paper is useful for packaging new and spare parts, which require specialized protection. 1 illustration. J.A.B.

TECHNICAL PAPERS CORPORATION, *Boston.* Paper tube wrapper improves yarn dyeing. Textile World 100, no. 1: 124 (January, 1950).

Brief reference is made to "Skintex" wet-strength paper wrappers manufactured from highly purified pulp which possess an extremely rapid capillary absorption, as well as fast permeability. The paper is wrapped around the perforated tubes which are used in package-yarn dyeing and is claimed to distribute the dye more evenly to the inner convolutions of the yarn than the previously employed stockinette sleeves. The cost of the wrapper is said to be only a fraction of a cent. 1 illustration. E.S.

PATENTS

MAKARA, FRANK. Patents. Paper Trade J. 130, no. 3: 40-1 (Jan. 19, 1950); *cf.* B.I.P.C. 19: 863.

The patent contract, the employee contract, and the license (royalty) contract are discussed, including certain stipulations of trailing clauses. E.S.

PHYSICAL TESTING—INK

BERNSTEIN, J. M. Comparative dispersion of pigments in various vehicles. Am. Ink Maker 27, no. 11: 29-33, 59 (November, 1949).

A study of the fineness of grind of printing-ink pigments is presented. Five different pigments were dispersed in each of five vehicles with the aid of an ink mill, making a total of 25 combinations. The fineness of grind was determined after each run by means of a roller-applicator type of fineness-of-grind gage and photomicrographs. The data obtained by these two methods indicate, with few exceptions, a progressive decrease in the value of the dispersion index on continued milling. The principal exceptions are the steam-set vehicle grinds which tend to increase in value after four grinds, probably by picking up moisture from the air which causes flocculation of the previously dispersed pigment. In addition, electron photographs were taken of several grinds which, on the whole, confirm the data from the fineness-of-grind gage. 7 tables, 3 figures, 3 electron photographs, 9 photomicrographs, and 4 references. E.S.

PHYSICAL TESTING—PAPER—PRINTABILITY

CAHN, LEO. Pre-testing paper ink absorption; a move toward standardization. Modern Lithography 18, no. 1: 51-2 (January, 1950).

During recent years, the K & N test has found considerable acceptance as a quick and practical test of the rate of ink absorption on coated papers; this consists of applying a nondrying ink with an oil-soluble dye in a heavy layer on the coated side of the paper for two minutes, then removing it and comparing the depth of the resulting stain with other papers of known ink-absorption and lithographing qualities. An attempt has been made to standardize these tests, using a densitometer to express the values of K & N stains numerically. For best results, readings should be carried out within two hours after the stain has been produced. Papers showing a medium stain of 0.15 to 0.28 have been found to give best results in printing and lithographing. This test is also valuable in discovering spottily coated paper. 5 figures. J.A.B.

PHYSICAL TESTING—WAX

FUNK, C. S., DAVIS, H. D., HANSON, J. E., and SEGESSER, J. R. Determination of sealing strength of paraffin wax. Anal. Chem. 22, no. 1: 179-82 (January, 1950); Modern Packaging 23, no. 6: 127-9, 182, 184 (February, 1950).

In the manufacture of waxed, heat-sealing wrappers, such as bread wrappers and carton wrappers, the sealing strength of paraffin wax plays an important part in the efficient performance of the wrapper. The authors describe a laboratory method of applying uniform films of paraffin wax to paper, sealing the waxed sides together between hot glass plates at about 200° F., and measuring the force required to separate the heat-sealed papers in a sealing-strength tester. The accuracy of the method is within 5%; it also correlates with commercial results. The waxing temperature and moisture content of the paper before waxing for normal laboratory conditions do not

affect sealing-strength values. Although sealing strength increases with sealing temperatures, the increase between 200 and 250° F. is only 8%. The tests run at higher temperatures did not indicate any advantages over those run at 200° F.; experimentally, it is easier to work at the lower temperature. In addition to the evaluation of straight paraffin, the method can be applied to the comparison of the sealing ability of wax blends and for testing wax additives. 6 tables, 5 figures, and 2 references. E.S.

PLASTIC FILMS (NONCELLULOSIC)

GERHARDT, FISK. Fruit film results. Modern Packaging 23, no. 5: 125-7, 170 (January, 1950); *cf.* B.I.P.C. 18: 742.

A report is given of studies on the packaging of sweet cherries, the objective of which was to find a film of sufficient transparency and strength, yet allowing proper gas diffusion to maintain a noninjurious concentration of carbon dioxide gas sufficiently high to prevent decay and to preserve the natural brightness of the fruit. The following types of films and foils were used: Pliofilms 75FF, 50P$_4$F, and 100FF as windows on coated paper; cellophane 300 LSAT, 450 LSAT, and Duplex 300/300 LSAT; Kodapak II (cellulose acetate butyrate) No. 130 and No. 200; Reynolon (cast polyethylene) No. 1150 and No. 1300; Reyfoil (plain aluminum metal foil) and the heat-sealable foil, both in 0.0015-in. gage; and Reyseal-502 (a thin aluminum foil with paper backing). Bing cherries were packaged in the various materials, kept at a temperature of 36° F. for 11 days, then removed to a temperature of 75° F. for two days to represent extremes in transit and retail marketing. Subsequent tests indicated that none of the materials combined a sufficient degree of transparency, strength, and gas permeability to control decay, preserve the natural brightness of the fruit, and enhance its dessert quality. 3 tables, 1 illustration, and 3 references. J.A.B.

PLASTICS—HONEYCOMB

TUTTLE, O. S. The practicality of honeycomb engineered laminates. Bakelite Rev. 21, no. 3: 6-9 (October, 1949).

Honeycomb laminates, the new lightweight, high-strength structural panels produced by U. S. Plywood Corp. for building construction, furniture, bulk packaging, and other large-volume industrial fields, offer such attributes as high compressive and bending strengths, good thermal insulating properties, a very low water-vapor transmission rate, fire resistance, structural durability, and extremely low maintenance costs. These laminates are a combination of a honeycomb core, Bakelite resin impregnants and adhesives, and two relatively thin, dense, high-strength faces or skins. The core is a structure with hexagon-shaped cells formed by walls of thin sheeting material, which may be phenolic resin-impregnated paper, cotton, glass fiber, or corrugated aluminum foil. For facings, practically any sheet material may be used, including a new type of asphalt-treated veneer and paper laminate known as "Protekwood." The exterior grade is produced in 3-ply and 5-ply thicknesses, consisting of asphalt and phenolic resin-impregnated kraft paper laminated with phenolic resin under heat and pressure to a birch core. 11 illustrations, depicting different applications. J.A.B.

PLASTICS—TESTING

SETCHKIN, NICHOLAS P. A method and apparatus for determining the ignition characteristics of plastics. J. Research Natl. Bur. Standards 43, no. 6: 591-608 (December, 1949).

A method and apparatus for the determination of the ignition temperatures

of plastics are described. The apparatus is operated by the constant air-temperature method, which is suitable for the determination of flash, as well as self- or autogenous-ignition temperatures. The flash temperature is that temperature at which the specimen yields combustible gases ignitible by a flame. The self-ignition temperature is the lowest temperature of supplied air, under optimum conditions of air flow, at which a reaction of the specimen or of its decomposition products begins and is self-accelerated to the state of combustion. The described method generally results in lower and more consistently reproducible values of the self-ignition temperature than those reported by several other investigators. Twenty-seven different specimens of plastics (both thermoplastic and thermosetting, the latter in most cases reinforced with paper, asbestos, cotton, or glass fabrics), covering a wide range in characteristics, were tested by the method described. The lowest values of the temperatures defined as "flash" and "self-ignition" were selected to indicate the fire hazards of the plastics. The flash temperatures of most of the plastics studied are in the range from 280 to 525° C., with the exception of cellulose nitrate, which flashes at 141° C. The self-ignition temperatures for 17 of the 27 specimens lie in the range from 430 to 500° C. Cellulose nitrate, however, self-ignites at 141° C., whereas specimens of glass-cloth melamine laminates ignited at 623 and 645° C. These temperature values were found to be reproducible to within one or two degrees. 4 tables, 10 figures, and 9 references. E.S.

PLYWOOD

ANON. Tough surface for tougher service. Bakelite Rev. 21, no. 3: 16-18 (October, 1949).

Plywood, surfaced with a sheet of Bakelite phenolic resin-impregnated paper, is given increased dimensional stability, a lower rate of moisture absorption, and an excellent surface for subsequent painting and finishing. The surface consists of special paper stocks impregnated with Bakelite water-soluble phenolic resin by Kimberly-Clark Corp. (Kimpreg); this is fused to the plywood in a conventional hot press. Different applications of the material are discussed. 8 illustrations. J.A.B.

POLAROGRAPHY

WAWZONEK, STANLEY. Organic polarography. Anal. Chem. 22, no. 1: 30-3 (January, 1950); *cf.* B.I.P.C. 19: 422.

A review is given of the work done during the past year on the reduction of nitro compounds and the further application of the polarographic method to the quantitative determination of organic and inorganic compounds; the subject is divided into reversible systems and the following irreversible systems: aldehydes, ketones, acids, organic halides, nitro compounds, unsaturated hydrocarbons, peroxides, sulfur compounds, heterocyclic compounds, and the determination of metals. Structural formulas are included. 58 references. J.A.B.

PRINTING AND PRINTER'S INK

ANON. Paper stretch. Am. Pressman 59, no. 11: 38-9 (October, 1949).

A discussion is given of the causes and methods of compensation for various types of paper stretch encountered in the lithographic shop. Methods are described for changing the packing of the blanket and plate to print longer or shorter; to correct for bearer-to-bearer stretch, the plate must either be remade or removed and cut into strips, which are reset for correct register. Many of the stretch problems could be eliminated by proper preconditioning of the paper. J.A.B.

ANON. Printers' paper problems. X. The inconsistency of repeat makings. Indian Print & Paper 15, no. 61: 28 (October, 1949); *cf.* B.I.P.C. 20: 415.

The difficulties in obtaining uniform successive paper deliveries and the reasons of this inconsistency are discussed. Recent technical progress in the industry, testing developments, and standardization procedures have greatly reduced the nonuniformity in papermaking; however, the human element can never be completely eliminated. The printer should carefully compare fresh samples with those of previous deliveries, not only with those of the most recent lot, but possibly with deliveries made a year ago or more.
E.S.

KING, CHARLES F. Harder paper and tackier ink. Inland Printer 124, no. 4: 39-42 (January, 1950).

In attempting to print on coated papers to satisfy the demand for sharp glossy prints, lithographers encountered several difficulties. Papermakers, in order to produce coated papers which would withstand the pull of tacky inks used in lithography, strengthened the bond between the coating and body stock and made the coating harder, thus reducing its tendency to pick. This greatly reduced the ink penetration of the coating, so the ink was made tackier, and an endless chain of harder coatings and tackier inks was started. Other difficulties are discussed, such as pressure adjustments, waterlogging of the ink, and resulting color variations. Dilution of the ink with varnish has been found to overcome waterlogging, because the thinner ink soaks into the paper more readily and the greater volume which is transferred more than compensates for the loss in strength. New offset inks placed on the postwar market appear to be weaker than their conventional counterparts, but actually print stronger on paper. Their action is to wet the paper faster, thereby effecting the transfer of a greater volume of ink to the sheet. J.A.B.

MACDOUGALL, G. Paper smoothness and printing quality. Patra J. 12, no. 3: 22 (September, 1949).

The quality of a printing job depends, for one thing, upon the surface smoothness of the paper or board, and faulty coating can ruin the print. If a whole delivery has the same coating defect, adjustments in the make-ready, ink consistency, and speed of running may overcome this, but if there are variations throughout the stock, the printer has real difficulties. 2 illustrations. J.A.B.

ST. JOHN, EUGENE. Color matching is costly problem. Inland Printer 124, no. 3: 52; no. 4: 71-2 (December, 1949, January, 1950).

The maintenance of uniform color is one of the most difficult of the printer's problems. A supply of uniform ink by the inkmaker is essential, and this may be achieved only if complete specifications are included with the order. Along with samples of paper, he should be supplied with the engraver's proof and information concerning the kind of press to be used, its running speed, and the local atmospheric conditions. In ordering inks, the prime considerations are usually the conditions they must undergo after printing and their possible exposure to sunlight, smoke, sulfur fumes, dampness, high temperature, etc. Several of the variable factors affecting color control are mentioned. The qualities of the various colored pigments are discussed.
J.A.B.

RAW MATERIALS

MARTAING, JACQUES. Cellulose and lignin in industrial chemistry of the near future, according to scientists and technologists of America and Europe. Papeterie 71, no. 12: 474-5, 477, 479, 481, 483 (December, 1949). [In French]

The author reviews recent publications on the cellulosic raw-material problem, with particular reference to the better utilization of existing resources and waste products. 28 references. E.S.

RAW MATERIALS—NON-FIBROUS

POOR, EDWARD N. Nonfibrous raw materials—1949. Tappi 33, no. 1: 36A, 38A, 40A, 42A, 44A (January, 1950); *cf.* B.I.P.C. 19: 719-20.

Brief reports on the demand and supply situation, price trends, and consumption are given for the following chemicals and nonfibrous raw materials used in the pulp and paper industry during 1949: caustic soda, soda ash, lime, sulfur, sulfur dioxide, chlorine, sodium peroxide, rosin, casein, alum, sodium aluminate, glue, starch, enzymes, dyestuffs, clay, zinc sulfide pigments, titanium pigments, synthetic resins, wet-strength resins, wax sizes, plasticizers (glycerin, invert sugar, corn sugar and syrup, sorbitol, urea, and sodium nitrate), and bactericides and fungicides. E.S.

SHALLCROSS, RUTH E. Supply-demand data on chief nonfibrous raw materials used in the pulp and paper industry. III. Organic papermaking chemicals. Tappi 33, no. 1: 14A, 16A, 18A, 20A, 22A, 24A, 26A, 28A, 30A, 32A (January, 1950); *cf.* B.I.P.C. 20: 310.

Statistical supply-demand data (to the extent that they are available) on rosin, starch, glue, casein, waxes, glycerin, and synthetic resins consumed by the pulp and paper industry are given. 45 references. E.S.

RAYON—VISCOSE PROCESS

ROSE, L. The structure of textile fibres. IX. The structure of viscose rayons. J. Textile Inst. 40, no. 11: P1036-47 (November, 1949).

A popular description of the structure and properties of viscose rayons is given, including a brief outline of the manufacturing process, followed by a discussion of the orientation of the fibers, the effects of radial shrinkage, the properties of the skin of the viscose filaments, the properties depending upon the crystalline-amorphous ratio, and the mechanical properties as products of the amorphous parts. The crystalline regions provide the stability of the structure to swelling and strong cross linkages between chains which enable the amorphous regions to play their full part. A theoretical comparison is made between the load-elongation curves for a mechanical model illustrating the properties of viscose rayon and the behavior of actual rayon fibers. 5 figures. E.S.

SAMUELSON, OLOF. Investigations concerning the filtering properties of viscose. III. Svensk Kem. Tid. 61, no. 10: 227-34 (October, 1949). [In English] *cf.* B.I.P.C. 20: 267.

In a previous paper (*cf.* B.I.P.C. 19: 110-11) the author demonstrated that viscose manufactured from pulps with a low resin content does not filter as well as that from pulps with a high resin content. Filtration of the low-resin pulp viscose was improved by adding a wetting agent during the steeping or shredding of the pulp, but not when it was added during the dissolution of the xanthate. In the present report this work has been confirmed and extended. The turbidity of the filtered solution decreases with decreasing resin content; however, it is concluded that the effect of the wetting agent is not to give less efficient filtering, but rather to result in a decrease in the amount of filter-clogging particles, provided that the addition is made before the beginning of the xanthation. Experiments with emulsion xanthation, using the methods of Bartunek (*cf.* B.I.P.C. 15: 319) and varying the concentrations of sodium hydroxide and carbon disulfide, are interpreted as showing that the carbon disulfide concentration in the sodium hydroxide phase increased on addition of the wetting agent; this results in a more complete xanthation than would be obtained if the reaction was carried out without a wetting agent, and thus gives better filtering properties. Differences between emulsion xanthation and commercial viscose manufacture are discussed; the work is being continued to obtain more information on the mechanism of the effect of wetting agents in ordinary xanthation. 3 tables, 2 figures, and 5 references. M.A.H.

RESEARCH

ANON. Printing, Packaging and Allied Trades Research Association; notes on the Association's publications and activities. Paper Making and Paper Selling 68, no. 3: 45-9, 17 (1949).

Some of the Association's current publications and activities are recorded, including PATRA's printing research program, the objectives of which are listed. One of these is the improvement of the durability of books, and research is being carried out to find the cause of defects and the influence of variables. Another objective is the improvement of the stereotyping process, and to this end, questionnaires have been sent to members to gather information on the various methods of making stereotyping mats (flong), desirable properties, etc.; a copy of the questionnaire is included. Mildew is explained and suggestions are given for its prevention. The importance of keeping books and binding materials cool and dry is emphasized. J.A.B.

RIDDELL, G. L. Packaging and Patra. Paper Box Bag Maker: 102A-102C (September, 1949); *cf.* B.I.P.C. 20: 199-200.

A description is given of the comprehensive service of advice, information, and research testing offered by the Printing, Packaging and Allied Trades Research Association. 5 illustrations. E.S.

RIDDELL, G. L. Progress of printing research: a review of the progress made by Patra during the year 1948-49. Paper Market: 120-2 (November, 1949).

The present status of the various printing research projects of PATRA is reviewed briefly. E.S.

RIDDELL, G. L. Progress with packaging research. Paper Box Bag Maker: 202 (November, 1949).

A brief review of the work of PATRA during the year 1948-49 is given. E.S.

RESEARCH LABORATORIES

PAINE, F. A. PATRA's package testing service. Patra J. 12, no. 3: 2-7 (September, 1949).

PATRA has set up equipment to reproduce the hazards encountered in transit and has instituted a research program to correlate the laboratory tests with actual performances. The drum test, drop test, compression test, vibration test, and inclined plane-impact test, in addition to tensile, burst, and tearing tests, are used to determine the strength of packages, and they are also tested for their resistance to moisture, mold, and insect attack. 11 illustrations. J.A.B.

RIDDELL, G. L. Package testing on the continent. Patra J. 12, no. 3: 8-19 (September, 1949).

A report is given of visits to three packaging laboratories, apparently the only three currently in operation outside of private firms, in Europe. The laboratories in Brussels, Delft, and Paris are described, and information is given concerning their means of support, available equipment, method of operation, and personnel. The purpose of the visits was to study methods in preparation for setting up PATRA's intended package testing laboratory. 14 illustrations. J.A.B.

RHEOLOGY

ANDERSSON, O., IVARSSON, B., NISSAN, A. H., and STEENBERG, B. The rheology of paper. III. Paper-Maker (London) 118, no. 5: 335-8, 340-1 (November, 1949); *cf.* B.I.P.C. 20: 269-70.

The authors set forth their method for obtaining the visco-elastic properties of paper, using graphical analysis of the load-elongation curve for a strip of paper (*cf.* B.I.P.C. 18: 246-7). When a paper strip is subjected to a constant rate of strain, the load builds up linearly for small strains; then the rate of change of load falls off and the load again increases linearly with strain, but at a much lower rate. The recorded curve therefore exhibits two linear portions. If, after the strain has attained a fairly high value, the strain is held constant, the load in the specimen falls off at a declining rate, but does not approach zero, even after the passage of several days. The load-elongation curve for paper is similar to that which would be obtained with a spring in parallel with a Maxwell element, which constitutes a spring in series with a dashpot. The authors' graphical analysis is based on this three-element model. The second linear portion of a load-elongation curve is interpreted to correspond to constant force in the Maxwell element (and constant rate of elongation of the dashpot) and the linear rise of the curve in this portion is attributed entirely to the parallel spring. The graphical methods are given for determining the spring constants of the two springs, the working curve of the Maxwell element, and, from the latter, the rate of plastic flow and the viscosity of the material. Illustrative graphs are given which depict the influence of relative humidity and tension on the elastic constants during drying; the dependence of the rate of plastic flow and viscosity on the load on the Maxwell element; and the dependence of viscosity on direction in the paper, rate of extension of the dashpot, tension during drying, relative humidity, and beating. The relationship of the visco-elastic properties to more familiar characteristics is discussed; in one illustration it is shown that there is a strong connection between the apparent viscosity and quality of flongs (stereotyping mats). 1 table, 17 diagrams, and 3 references. J.A.V.

SAFETY

ADERHOLD, HOWARD H. Marathon builds effective safety program. Paper Ind. 31, no. 10: 1194-7 (January, 1950).

The development of an effective safety program at the Menominee, Mich. plant of the Marathon Corp. is outlined. The program followed a pattern recommended to all mills by the National Safety Council and resulted in the drastic reduction of accident frequency from 52.6% in 1947 to 10.2% in 1949. 3 tables and 7 charts. E.S.

SETUP BOXES

ANON. Hand-work for juniors. Paper Box Bag Maker: 100-2, 156-9, 193-4, 196-9 (September-November, 1949).

Detailed instructions are given for making paper boxes by hand, an art which is much less popular today than formerly. The essential equipment is listed and the use of each item is explained. The methods of making both a sample box and a more intricate luxury box are described. Numerous illustrations. J.A.B.

MODERN PACKAGING. Whitman's sampler. Modern Packaging 23, no. 5: 90-5, 172 (January, 1950).

Among the packaging distinctions claimed by Stephan F. Whitman & Sons, Inc., are the following: it was the first company in its field, or possibly in any field in this country, to use cellophane for packaging; it originated the in-the-lid diagram technique for identifying each piece of candy; it introduced the refrigerator display case to eliminate seasonal fluctuation in sales; and its boxed candies were the first to be nationally advertised and distributed. The design on the Whitman's Sampler box, created in 1912, has changed little since that time and still signifies to the public the best in quality candy. 15 illustrations. J.A.B.

SHIPPING CONTAINERS

ANON. Corrugated replaces wood for 100 lb. winch. Am. Boxmaker 39, no. 1: 30-1 (January, 1950).

American Hoist and Derrick Co., St. Paul, has solved its problem of packaging a 100-pound steel winch, formerly shipped in a wood crate which was cumbersome and allowed a collection of dust on the unit, by changing to a corrugated shipping container. A saving of 75 cents per unit in direct packing costs has been realized, plus an additional saving in freight charges resulting from a 20% decrease in weight. 2 illustrations. J.A.B.

ANON. Easy opening container "stock boys' delight." Packaging Parade 18, no. 204: 42 (January, 1950).

A new shipping container developed by the California and Hawaiian Sugar Refining Corp., San Francisco, may be opened merely by pressing down on one flap and pulling up on the other, thereby eliminating the danger of knife damage to individual packages. A diamond design on the top flaps prevents any glue from adhering to the printed area, but permits enough glue to adhere to the unprinted area to insure a firm seal. 4 illustrations. J.A.B.

HAMPEL, CLIFFORD A. Sodium fluosilicate for rodent-repelling containers. Fibre Containers 34, no. 12: 142 (December, 1949).

Reference is made to studies at the Armour Research Foundation dealing with the possibility of using sodium fluosilicate to render corrugated and solid fiber shipping containers for warehouse storage rodent- and rotproof, either by coating them on the outside with a vehicle containing the chemical or by incorporating it in the liner or corrugating medium; it is not recommended for folding boxboard. The need for further work is indicated. Sodium fluosilicate is a toxic material, although not considered a dangerous poison to man unless the dosage runs into several grams. E.S.

SHIPPING CONTAINERS—PALLETIZING

ANON. Palletizing paper bags. Chem. Eng. News 28, no. 1: 62 (Jan. 2, 1950).

Palletized shipments of multiwall and small paper bags by Bemis Bro. Bag Co. have resulted in large savings to customers in handling and storage costs. Different types of pallets are described and the factors to be considered in evolving practical palletizing operations are discussed. J.A.B.

ARKELL & SMITHS, *Canajoharie, N.Y.* Reducing unloading, handling time. Packaging Parade 18, no. 204: 76 (January, 1950); Chem. Processing Preview 13, no. 1: 26-7 (January, 1950).

The empty paper bags are evenly distributed on expendable board pallets, a cardboard sheet is placed on top, and the entire package is covered with wrapping paper. The pallet is then compressed under a vertical drop-weight press, and steel strapping running under the pallet and over the top of the pile on four sides is secured while the package is in a compressed condition. This method yields tighter and neater packages which are easier to handle and saves about 50% in storage space. 6 illustrations in the first reference. E.S.

SHIPPING CONTAINERS—TESTING

BLATT, J. L., and TARASSUK, N. P. Manometric apparatus for gas measurements on packaged materials. Anal. Chem. 22, no. 1: 191-4 (January, 1950); *cf.* B.I.P.C. 17: 718.

A simplified manometric apparatus is described which is an improvement on Cartwright's method in that it overcomes the limitations of moisture and desorption. In this procedure, the gas pressure and free space volume in a container are derived from the measurement of pressure when the volume of the container gases is expanded by two fixed amounts. First, the system is evacuated by means of a leveling bulb, an adjustable scale is set for the proper atmospheric temperature and pressure conditions, and then the container is punctured by turning the pressure crank. By using the leveling bulb, the confining volume is successively extended to predetermined points, and the resultant pressures are noted. The comparative features of this procedure are discussed, and the precision of the results are tabulated. 1 diagram, 2 tables, and 9 references. J.A.B.

SISAL

PRESTON, R. D., and MIDDLEBROOK, MAVIS. The fine structure of sisal fibres. J. Textile Inst. 40, no. 10: T715-26 (October, 1949).

The slow growth of sisal fibers makes them a very appropriate material on which to study the structural peculiarities of different layers in the cell wall. In the present study it is shown that the narrow, first-formed outer layer of the cell wall differs from the bulk of the inner wall in that the

cellulose micelles there lie in a spiral forming an angle of about 40° with the cell length, whereas in the inner layer the angle is about 20°. It is further probable that the micelles in the outer layer are dispersed about their common direction much more than are those in the inner layer. The surface of the fiber is therefore structurally different from the bulk of the inner wall, and the same is probably true for many other fibrous cells (wood, bamboo, etc.). 2 tables, 10 figures, and 10 references. E.S.

SPECTROSCOPY, INFRARED

GORE, ROBERT C. Infrared spectroscopy. Anal. Chem. 22, no. 1: 7-11 (January, 1950); *cf.* B.I.P.C. 19: 430.

A detailed review is given of the literature which was published during 1949 dealing with infrared spectroscopy and which indicates the rising interest in this field. The references are classified under the following headings: books, instrumentation, polarization and crystal studies, qualitative analysis, quantitative analysis, hydrogen bonding, biological, polymers, reactions and combustion, astrophysical, and theoretical and molecular. 274 references. J.A.B.

STEELE, RICHARD, and PACSU, EUGENE. Cellulose studies. XV. Infrared spectra of trimethyl cellulose, cellulose, and starch. Textile Research J. 19, no. 12: 790-3 (December, 1949).

A technique for mounting films and obtaining their infrared spectra in a dry state is described, and the spectra of trimethylcellulose, cellulose, and starch are presented and discussed. 5 figures and 7 references. E.S.

STARCH

GILBERT, G. A., and SWALLOW, A. J. The influence of ions on the activity of Q-enzyme. J. Chem. Soc.: 2849-52 (November, 1949); *cf.* B.I.P.C. 18: 469-70.

The activity of Q-enzyme solutions is shown to be reduced by dialysis against dilute buffer solutions and restored by the addition of salts such as ammonium sulfate and sodium acetate. The dependence of the activity on the pH and concentration of solutions of ammonium sulfate has been determined. Sodium borate inhibits the enzyme even in the presence of activating ions. E.S.

LANSKY, SYLVIA, KOOI, MARY, and SCHOCH, THOMAS JOHN. Properties of the fractions and linear subfractions from various starches. J. Am. Chem. Soc. 71, no. 12: 4066-75 (December, 1949).

As a preferred mode of fractionation, starch is gelatinized in a buffered Pentasol-water mixture, gently refluxed for several hours, then cooled and refrigerated to precipitate the linear A-fraction. This technique avoids the slight hydrolytic degradation occasioned by autoclaving and likewise permits direct fractionation of nondefatted cereal starches. Improved methods have been developed for characterizing the starch fractions in terms of (*a*) intrinsic viscosity in 1 *N* potassium hydroxide solution, (*b*) iodine affinity by potentiometric titration, (*c*) reducing value toward alkaline 3,5-dinitrosalicylate reagent, and (*d*) retrogradation tendency of the linear component. These methods have been employed to describe and differentiate the linear A-fractions and branched B-fractions from corn, wheat, sago, Easter lily,

potato, and tapioca starches. In addition, these criteria have had useful application in detecting minor hydrolytic changes in the starch substance, in evaluating various modified starches, and in elucidating the action of β-amylase on the starch fractions. A study of the reducing values of the A-fraction toward hypoiodite, bromine, alkaline copper, ferricyanide, and alkaline dinitrosalicylate indicates that none of these reagents is specific for terminal aldehyde groups. A technique has been devised for subfractionating the A-fraction by successive partial precipitations with *n*-octyl alcohol. The A-fraction appears to consist of a continuous series of homologous linear polymers, rather than a limited number of discrete components. The linear material of longest chain length (as indicated by intrinsic viscosity and reducing value) is precipitated first by octyl alcohol, followed successively by subfractions of progressively shorter chain length. The ease of retrogradation of a linear starch substance is inversely related to its chain length. Linear subfractions of equal intrinsic viscosity and reducing value have the same retrogradation tendency, irrespective of their source. Thus the lower retrogradation of tapioca and potato starches must be attributed to the longer chain length of their A-fractions and not to anomalous branching. However, indirect evidence from iodine affinities suggests the presence of a material intermediate between the strictly linear and the highly branched fractions, possibly amounting to 5-7% of the total starch substance in the case of cornstarch. This material is precipitated by Pentasol but not by *n*-butyl alcohol. To minimize contamination of the fractions by this intermediate material, it is recommended that Pentasol be used for the primary separation and *n*-butyl alcohol for recrystallization. 4 tables, 4 diagrams, and 17 footnotes. E.S.

POTTER, A. L., HASSID, W. Z., and JOSLYN, M. A. Starch. III. Structure of apple starch. J. Am. Chem. Soc. 71, no. 12: 4075-7 (December, 1949); *cf.* B.I.P.C. 19: 352.

Apple starch was separated into amylose and amylopectin; the amylose content represented 24.8% of the total. Osmotic pressure measurements of the acetylated fractions gave a number-average molecular weight of 160,000 (560 glucose residues) for the acetylated amylose and 1,200,000 (4200 glucose residues) for the acetylated amylopectin. End-group determination by periodate oxidation showed an average of 24 glucose residues per end-group for the amylopectin and a chain-length of 530 glucose residues for the amylose. Since the end-group value for amylose is in fair agreement with the value of 560 obtained from osmotic pressure measurements, it is assumed that a single chain represents one amylose molecule. The data indicate that apple starch is similar in structure to the cereal and tuber starches, with the difference that the molecular weights of its components are smaller. 1 table and 10 references. E.S.

STEFFENS, O. R. Starch as a beater additive. Paper Mill News 73, no. 1: 16, 18, 22 (Jan. 7, 1950).

Following a brief review of recent literature on the retention of starch by cellulose fibers, the author discusses the types of starches used as additions to the aqueous paper furnish at some point between the beater and the wire, their effects on the resulting paper properties, and the variations in effectiveness. In attempting to evaluate accurately a beater starch addition, the tests should be conducted for a sufficiently long period to obtain a fair average of the many variables involved. I diagram and 8 references. E.S.

STATIC ELECTRICITY

KEGGIN, J. F., MORRIS, G., and YUILL, A. M. Static electrification in the processing of fibres; variation with moisture regain during carding. J. Textile Inst. 40, no. 10: T702-14 (October, 1949).

A simple experimental technique is described by which the electrostatic charge generated by a fiber during processing can be measured. This has been applied to eight typical fibers in their passage through a cotton flat carding engine. Figures are given for the over-all charge measured on the sliver for cotton, viscose, flax, cellulose acetate, wool, casein, Ardil, and nylon at various moisture levels. The fibers are divided into two groups. For wool, casein, Ardil, nylon, and cellulose acetate the charge increases with decreasing regain, until at levels corresponding roughly to the moisture take-up of the fibers at 60-70% R. H., the static electrification tends to reach a steady value of the same order for all five fibers. For the cellulose fibers cotton, flax, and viscose, the charges developed are much lower than for the protein fibers. The charge again increases with decreasing regain, but a constant level is not reached. The cellulose fibers tend to be negatively charged, whereas the charge tends to be positive for the "protein"-type fibers. It is shown that the behavior of these fibers can be explained on the assumption that the quantity of charge generated is independent of the regain of the fiber, and is of the same order for all eight fibers. As the regain of the fiber is increased, the proportion of this charge which is lost to the machine by the fiber between the cylinder and the sliver increases, so that the net charge carried away by the fiber decreases with increasing regain. By the use of resistance-regain relations, specially determined for this investigation, the electrification curves can be calculated with one fitted constant. There is reason to believe that the capacitance per unit length of fibers for wool, nylon, Ardil, and acetate is independent of regain, but that the capacitance of the cellulosic fibers increases rapidly with increasing moisture regain. 2 tables, 5 figures, and 3 references. E.S.

STATISTICAL METHODS

RENARD, J. The application of statistical methods to control problems of the paper industry. Papeterie 71, no. 11: 426-7, 429, 431, 433 (November, 1949). [In French]

The author describes the control of a paper machine by the statistical sampling of basis weight, tensile strength, burst, porosity, and opacity of the paper made. 9 figures. E.S.

TOULOUSE, J. H. Application of statistical methods to paper testing. Tappi 33, no. 1: 44-8 (January, 1950).

The author gives an introduction to the application of statistical methods to paper testing. The laws of probability, the two general methods of testing or comparison (i.e., the methods of attributes and variables), frequency distribution, sampling, and the use of control charts are considered briefly. 3 tables. E.S.

STRAW

ATCHISON, JOSEPH E. Some observations on the use of straw and other agricultural residues in the European pulp and paper industry. Tappi 33, no. 1: 46A, 48A 50A (January, 1950); Paper

Ind. 31, no. 10: 1202-3, 1228, 1230, 1232, 1234, 1236, 1238, 1240-3; no. 11: 1348-52 (January, February, 1950).

The present and potential utilization of straw in Italy, Western Germany, Netherlands, Belgium, France, Austria, and the United Kingdom is reviewed. E.S.

P. G. Composition of straw. Papeterie 71, no. 12: 493, 495 (December, 1949). [In French]

The ash and cellulose contents of various straws (rye, barley, wheat, rice, and oats) and cornstalks are discussed briefly, with emphasis on the influence of growth conditions. The chemical composition of one variety of straw obtained from the same field may vary from year to year, so that it is not possible to make a valid prediction of specific data over a period of years. L.E.W.

STREAM POLLUTION

DELCROIX, PIERRE, *and others*. Discussion of the waste-liquor problem. Bull. assoc. tech. ind. papetière 3, no. 5: 73-84 (December, 1949). [In French]

A round-table discussion is presented in which the industrial waste liquors from pulp and paper mills in France and their effects on stream pollution are considered. The government agencies most concerned with prohibiting stream pollution are those in charge of the rivers and forests and bridges and highways. Heavy penalties for industrial stream pollution were legalized in February, 1949, whereby offenders may be fined 5000-200,000 francs, with possible imprisonment for one to five years. These have encouraged renewed studies of stream pollution and its amelioration; in fact, such studies are demanded by law. L.E.W.

HODGE, W. W. Progress in the treatment of pulp and paper mill wastes. Proc. 9th Ann. Water Conf. Engrs. Soc. West. Penna.: 29 p.; discussion: 4 p. (1948).

This is an extensive review of the many waste problems in the pulp, paper, and board industries, covering solid wastes in general; liquid wastes from the different pulping processes, deinking, and bleaching; white water; and strawboard-mill wastes. Specific examples of recent developments in the reduction of stream pollution by mills in Tennessee, Pennsylvania, Maryland, Michigan, Texas, Minnesota, and Ontario are listed. 6 tables, 17 figures, and 81 references. E.S.

PORTER, C. C., and BISHOP, FRED W. Treatment of paper mill wastes in biochemical oxidation ponds. Ind. Eng. Chem. 42, no. 1: 102-6 (January, 1950).

The problem is presented as the result of waste from the Southland Paper Mills, Inc., Lufkin, Tex., entering a natural water course which has a very low flow during the dry summer months. The total mill effluent is a combination of wastes from a kraft pulp mill, bleach plant, groundwood pulp mill, newsprint machine, and cylinder board machine. The work in the laboratory soon exhausted the possibilities of chemical or physical treatment from the economic standpoint. Storage tests in large crocks performed on individual departmental waste and on the total mill effluent indicated that the best results of over-all B.O.D. reduction could be expected from physical treatment.

Further storage tests were run on the total mill effluent under sterile conditions, and also under conditions of supplemental seeding and feeding. The analysis of these data indicated that relatively short periods of storage by impounding effected biochemical oxidation by the native bacterial flora. The problems and results of two years of successful operation with the large retention ponds are presented. Normally, the B.O.D. on the total mill effluent is reduced 70% as a result of biochemical oxidation in the retention ponds before it is discharged into the river. The supplemental measures required for a mill expansion program are mentioned, and the results of these measures are brought up to date. 3 figures. E.S.

TYLER, RICHARD G. The University's part in stream-pollution control. Trend in Engineering 2, no. 1: 4-9 (January, 1950).

With particular reference to the water-pollution problems affecting the fishing industries in the State of Washington, the author discusses the results of several experiments for the safe disposal of sulfite waste liquor in various sections of the country. The part played by the Engineering Experiment Station and the Sanitary Engineering Laboratory of the University of Washington in studying water-pollution problems is mentioned. 2 illustrations and 2 diagrams. E.S.

WARING, F. H. The legal phases of water pollution control in Ohio. Tappi 33, no. 1: 63-4A; discussion: 64-5A (January, 1950); Fibre Containers 35, no. 1: 42, 47 (January, 1950).

The developments in state, interstate, and federal legislation are reviewed, as they apply to the control of stream pollution in Ohio. E.S.

SULFATE MILLS

ANON. Fraser makes kraft pulp; new mill starts up. Pulp & Paper 24, no. 1: 32 (January, 1950).

Reference is made to the start of operations at the new kraft mill at Newcastle, N.B., which produces 120 tons of unbleached sulfate daily; the pulp is shipped to the Edmundston mill of the company, where a new six-stage continuous bleach plant has been constructed. The major modernization projects at the different mills of The Fraser Companies during recent years are listed. E.S.

SULFITE PROCESS

SAMUELSON, OLOF, BERNSON, INGVAR, and REGESTAD, SIXTEN OLOF. The influence of the cooking conditions on the hot alkali solubility of unbleached sulphite pulps. Svensk Kem. Tid. 61, no. 10: 234-41 (October, 1949). [In English]

Despite the complications caused by lignin and the hemicelluloses, there exists in unbleached spruce sulfite pulp a relationship between the carbonyl content and the viscosity. The carbonyl content was measured by the percentage solubility of two grams of pulp in 100 ml. of 7% sodium hydroxide after heating for three hours in a bath of boiling water. The correlation is of the same type as that for acid-hydrolyzed pure cellulose. The conclusion is reached that a high alkali solubility is inevitable when wood is cooked to normal rayon pulp viscosities. Improvement in the resulting pulp can only be attained through proper bleaching and purification in subsequent stages. 12 tables, 2 graphs, and 14 references. L.E.W.

SULFITE WASTE LIQUOR

BRUNES, BENGT. Combustion of sulfite waste liquor. Svensk Papperstidn. 52, no. 21: 529-32 (Nov. 15, 1949). [In Swedish; English and German summaries]

Sulfite waste liquor, when concentrated to approximately 50% dry solids or dried to a powder, yields a fuel with high sulfur and ash contents. A high sulfur content may result in the formation of sulfur trioxide in the flue gases, thereby raising the dew point. In exceptional cases the high ash content may cause the formation of considerable deposits on the heating surfaces, particularly the superheaters. The greater part of the ash can be removed by mechanical dust separators. It is not difficult to obtain good combustion results with the dry powder of sulfite waste liquor in a well-cooled furnace and without additional fuel. However, for burning sulfite waste liquor with 50-55% dry solids, a high-grade supplementary fuel is required, or the cooling of the walls must be omitted to obtain a sufficiently high temperature in the furnace room. In spite of these precautions, it is difficult to obtain satisfactory combustion results because of incomplete burning of the liquor and losses of combustible matter in the ash. E.S.

GLANZER, P. Problem child of chemical pulp. Can. Pulp Paper Ind. 3, no. 1: 21, 30, 34 (January, 1950).

The author reviews recent developments in the utilization of sulfite waste liquor; brief reference is also made to tall oil and turpentine as by-products of the sulfate industry. E.S.

HOLDERBY, J. M., and WILEY, AVERILL J. Biological treatment of spent liquor from the sulfite pulping process. Sewage Ind. Wastes [previously Sewage Works J.] 22, no. 1: 61-70 (January, 1950).

The authors review the results obtained during the first 10 years of work conducted by the Sulphite Pulp Manufacturers' Research League, Inc., on biological methods of disposing of sulfite waste liquor (SWL), including the activated sludge treatment, trickling filter treatment, contact aeration, anaerobic methane fermentation, and yeast production. Of all these experiments, yeast production seemed the most promising, and a commercial-scale plant is now in continuous production at Rhinelander, Wis. The plant is still in an experimental stage and is deeply involved with mechanical processing problems, for which a completely satisfactory solution has not yet been found. Hence, the plant will be in the experimental category for some time in the future. The process is outlined briefly, supplemented by a flowsheet. Several promising biological processes reported by others are also reviewed, including ethyl alcohol production, acetone-butyl alcohol fermentation, lactic acid production, and foam-phase processing. A comparison of the different process efficiencies for the various biological methods is made, according to which the practical 5-day B.O.D. removal of *Torula* yeast amounts to 70-75%. The experience with biological treatment of SWL has served to show rather conclusively that, in order to be practical, a process should meet certain minimum requirements. It must be capable of handling very heavy loading to keep the capital investment within reason; it should be capable of removing a minimum of 65% of the 5-day B.O.D. from the waste liquor processed; and there must be a substantial recovery of values from the process to offset a portion of the operating charges. The recovery of products may be very expensive in terms of power, steam, equipment, or skilled labor. To balance these and many other costs it is imperative to recover

products which can be sold in large volume to stable markets. This consideration alone may be the final basis on which the practical feasibility of a process will be judged. 1 table, 4 figures, and 10 references. E.S.

THE SULPHITE PULP MANUFACTURERS' RESEARCH LEAGUE, INC. *Investigating Committee.* Report on the evaporation and burning of calcium base sulphite liquor in Scandinavia. Paper Trade J. 130, no. 1: 19-20, 22 (Jan. 5, 1950).

The present status of evaporation and burning of sulfite waste liquors in Sweden is reviewed under the four headings: liquor collection, evaporation, burning, and disposal of fly ash. The development of burning techniques has lagged considerably behind evaporation, with the result that sound principles for burning this material in quantity are not currently known. Three of the mills which concentrate liquor use all of the concentrate for road surfacing. Of the other six mills, two are burning their concentrate, and the remaining four mills are burning part of it and using the rest as a road binder. All mills which burn sulfite waste liquor are doing it in existing boilers with auxiliary fuels, such as wood refuse, coal, oil, or a combination of these. Fly ash from liquor burning presents a serious problem. The possibilities of transposing Swedish practice to Wisconsin mills are considered and the many problems involved are pointed out. A list is appended of the mills and establishments visited and the persons interviewed during the trip at which this information was collected. E.S.

YORSTON, F. H. Studies on sulphite waste liquor. I. The action of anion exchanges. Pulp Paper Mag. Can. 50, no. 12: 108-11 (November, 1949).

Cation exchangers (Amberlite IR120) were used to de-ash the waste liquor. Anion exchangers (IR4B and IRA400) then removed about 60% of the acidity, but the effluent still contained 70-80% of the original solids, 80-90% of the carbon, and 95% of the methoxyl. The weaker IR4B removed only 5-10% of the constituents reducing alkaline copper (mostly sugars), but the more basic IRA400 removed 9-40% of these sugars. Titration of the remaining acidity showed a sharp break near pH 7, in contrast to the gradual pH change of the original de-ashed liquor; apparently the weaker acids were removed and only the stronger lignosulfonic acids of large molecular weight passed through the basic resins. 9 tables, 1 diagram, and 7 references. J.W.G.

YORSTON, F. H. Studies on sulphite waste liquor. II. The extraction of sugars. Pulp Paper Mag. Can. 50, no. 12: 111-13 (November, 1949).

Passage of a de-ashed liquor through a IR4B resin removed the low molecular-weight acids. The adjustment of pH and the passage of the liquor through a IRA400 resin removed up to 40% of the sugars. The latter were desorbed by addition of a wet stream of carbon dioxide through the column with a total recovery of 60-70%. There was a deterioration in the sugar-retaining capacity of the resin when used with sulfite waste liquor, and some components were probably irreversibly absorbed, since the resin darkened with use. In contrast, a resin column, which had had no contact with waste liquor, gave a 95% recovery of absorbed sugar. Crystalline xylose was isolated from the recovered sugar, originally absorbed from waste liquor, and a positive test for mannose was noted. 3 tables and 2 references. J.W.G.

YORSTON, F. H., and PICHETTE, A. H. Studies on sulphite waste liquor. III. A note on the determination of methoxyl. Pulp Paper Mag. Can. 50, no. 12: 114 (November, 1949).

A mixture of vanillin and four parts of sodium sulfate gave a mean deviation of 0.7% from the mean methoxyl value. The method applied to methoxyl analysis of sulfite waste liquor gave a mean deviation from the mean of less than 2%. 2 tables and 4 references. J.W.G.

SURFACE AREA

ARNELL, J. C. Permeability studies. IV. Surface area measurements of zinc oxide and potassium chloride powders. Can. J. Research 27 A, no. 6: 207-12 (November, 1949); *cf.* B.I.P.C. 18: 713-14.

The use of the modified Kozeny equation for the measurement of the specific surfaces of fine powders has been extended to include a number of standard zinc oxides and a sample of potassium chloride. The specific surfaces of the zinc oxides had been measured by 10 other methods, and the data are included for comparison. Comparative low-temperature adsorption data for the potassium chloride are also given. Satisfactory agreement with other methods was found. 3 tables and 10 references. E.S.

TALL OIL

JUVONEN, V. V. Production of tall oil in Finland. Paper Trade J. 130, no. 1: 27-9 (Jan. 5, 1950).

The development and present status of the tall oil industry in Finland are outlined, with particular reference to the operations of the Kotka mill of Enso-Gutzeit which started commercial tall oil distillation in 1920. The influence of wood storage (on land or in water), storage period, and type of wood (round stock or sawmill waste) on tall oil yield is discussed. Maximum yields obtained in Sweden amount to 90 kg./ton of pulp and in Finland to 70 kg./ton of pulp, which represents 70 and 50%, respectively, of the theoretical yield. The chemical composition of tall oil is discussed; the principal constituents are unsaponifiable matter, resin acids, and fatty acids. The difficulties encountered in paper sizing with tall oil resin are explained and a technique for preventing the recrystallization of the material by the addition of 2-3% soda prior to melting is outlined. The sizing properties of tall oil resin are equal to those of rosin and the sized papers show less tendency to yellowing than ordinary rosin-sized papers. At present, the quantitative separation of the resin and fatty acids is not carried out on a commercial scale. Almost the entire output of Finnish tall oil (resin and fatty acids) is taken by the soap and lacquer industries. The need for simple, yet accurate analytical methods is stressed. During and after the last war, Finnish scientists have become very much interested in the study of the material and its possible applications; several laboratories are engaged in research on tall oil. 6 tables. E.S.

NATIONAL SOUTHERN PRODUCTS CORPORATION, *New York*. Tall oil abstracts, with particular reference to some end uses. Tappi 33, no. 1: 76-82A; no. 2: 58A, 60A, 62A, 64A, 66A, 68A, 70-80A (January, February, 1950).

An annotated bibliography on the possible applications of tall oil is presented. E.S.

TALL OIL ASSOCIATION. Tall oil in soap products. Tall Oil in Ind. Bull. no. 6: 4 p. (December, 1949); *cf.* B.I.P.C. 20: 353.

The utilization of tall oil in soap products (hard and soft soaps, soap powders, and liquid soaps), its advantages, and suitable alkalies are described. It is estimated that the total of all the tall oil converted into soap products is closer to 30 million pounds annually than the 16 million pounds disclosed for soap alone in the June 30, 1949 Bureau of the Census figures. E.S.

TEXTILE INDUSTRY AND FABRICS

GAGLIARDI, D. D., and NUESSLE, A. C. Modification of fiber and fabric properties by wrinkleproofing and stabilizing agents. Am. Dyestuff Reptr. 39, no. 1: P12-19 (Jan. 9, 1950).

The chemical, physical, and mechanical properties of cellulose fibers and fabrics may be altered to various degrees by treatment with a large number of compounds, whose action on cellulose appears to involve the formation of either chemical or physical cross linking of the molecular chains. The formation of such cross linkages reduces the swelling of the cellulose, changes its dyeing properties, decreases its solubility, reduces creep and fiber extensibility, raises the elastic recovery, produces wrinkle resistance and dimensional stability, increases the wet strength of the fibers, reduces the general toughness of the fibers, and produces fabrics of lower resistance to tear and abrasion at high stress application. The reduction of various strength properties is shown to be caused not by acid or heat degradation of the cellulose, but from the decrease in fiber extensibility. Except for formaldehyde and glyoxal, the reactions which take place on curing most wrinkleproofing and stabilizing agents in cellulose can be reversed by mild acid hydrolysis. Removal of the reaction product from the cellulose generally restores the original properties of fibers and fabrics. 10 tables, 7 diagrams, and 12 references. E.S.

VANILLIN

KATZ, ALEXANDER, HALL, ALVAH G., and PETERSEN, ROBERT. Lignin and vanillin from *Yucca brevifolia* of California. Proc. Conf. on Cultivation Drug and Assocd. Econ. Plants Calif.: 85-109 (1947); C. A. 43, no. 2: 819 (Jan. 25, 1949).

This research was directed toward the production of vanillin from ligneous material present in yucca fiber. Two samples containing 8.15 and 9.95% lignin were oxidized with potassium chromate, potassium dichromate, and potassium permanganate with negative results. Acetylating the material prior to oxidation gave no improvement. The material was treated with 25% sodium hydroxide solution, acidified with acetic acid and sulfuric acid, oxidized with potassium dichromate, refluxed with sodium hydroxide solution, and extracted with chloroform. When the solvent evaporated, a strong odor of vanillin was observed. When the experiment was repeated without oxidation, no aromatic odor could be detected. Decreasing the time of oxidation from one hour to 10 minutes decreased the intensity of the vanillin odor. The yield was only 0.05% of the starting material; because of a delay between synthesis and assay, it is believed that some was lost by oxidation on standing. 3 tables, 2 graphs, 4 figures, and 127 references. J.A.B.

VISCOSITY

DE BRUYNE, N. A. Viscometer for thick liquids. Brit. Plastics 21, no. 246: 590-3, 626 (November, 1949).

The author describes an instrument, basically similar to the Bingham-Murray viscometer, devised for the determination of the viscosity of volatile, sticky, and opaque materials. By means of a known constant air pressure, the liquid under test is forced into a horizontal glass capillary tube marked in such a way that the viscosity is numerically equal to a simple multiple of the time required for the liquid meniscus to pass from one mark to another. The procedure is described in detail and some of the results are tabulated. 7 figures. J.A.B.

WAGES

"STENSON." Piece-rate procedure. Paper Box Bag Maker: 134-6, 176-8, 175 (April, May, 1949); 51-4, 92-3, 95-7 (August, September, 1949).

Two methods for fixing piece rates on cutting and scoring machines in British box plants are outlined; the second series of observations was much more intensive than the first one. Tabulated data and 7 diagrams. E.S.

WATER AND WATER TREATMENT

ANON. Nanaimo sulphate plant installs first Ranney wells in Canada. Can. Pulp Paper Ind. 2, no. 12: 10-12 (December, 1949).

The construction and installations of two Ranney wells for collecting ground water by the Nanaimo Sulphate Pulp Limited plant on Vancouver Island are described. The Ranney water collector consists of a reinforced concrete caisson or shaft 16 feet in diameter, sunk from the surface down to the aquifer to be tapped. Near the bottom of the shaft about a dozen horizontal perforated pipes extend radially about 150 feet, like the spokes of a wheel, through precast holes in the caisson. A pumphouse is erected atop the shaft. At the Nanaimo wells, which are 3000 feet apart, the delivery mains will discharge into a 40-inch wood-stave pipe line, running five and a half miles to the plant. Some 20 million gallons of water a day will be delivered. 1 diagram and 5 illustrations. E.S.

WAXES

ODE, W. H., and SELVIG, W. A. Extractable waxes from American lignites. Ind. Eng. Chem. 42, no. 1: 131-5 (January, 1950).

This survey of the solvent extraction yields of American lignites showed that, of all the lignitic coals examined, the highest yields were obtained from certain Arkansas and California lignites. Some of these yields were similar to those obtained in commercial extraction of montan wax from German brown coal. The lignites examined from Montana, North Dakota, Texas, and Washington contained appreciably smaller quantites of extractable material than the Arkansas and California lignites. The yields of extract from the subbituminous coals were low. Although higher extraction yields were obtained with a solvent mixture of benzene and alcohol than with benzene alone, the properties of the benzene extracts more closely resembled commercial grades of montan wax than did the benzene-alcohol extracts. The most significant difference between the extracts obtained from American lignites in this investigation and the Riebeck brand of wax from Germany was the greater resin content of the extracts from the domestic lignites. In this respect they more closely resembled a commercial grade of montan wax imported from Czechoslovakia. The benzene-alcohol extracts had a higher content of asphaltic material than the benzene extracts. If required, the resins and asphaltic material probably could be removed from

the crude extracts by suitable solvent refinement. 1 figure, 4 tables, and 19 references. E.S.

WET STRENGTH

LAGALLY, PAUL. Production of wet-strength papers by means of melamine resins. Das Papier 3, no. 11/12: 192-200; no. 21/22: 428-34 (June, November, 1949). [In German]

The melamine resins (I) proved far superior to urea resins in their affinity for and retention by cellulose. In practice, suitably aged (I) solutions were added to the stock after beating, thus largely eliminating salt effects and uneven impregnation. The aging of (I) solutions is discussed in detail and experimental data are given on conditions for preripening in which (I) are polymerized with acid to the point at which they are still water-soluble, but strongly sorbed and held by the pulp. This initial aging period is influenced greatly by resin concentrations, acid concentrations, and by temperature. Solution changes were followed by means of photoelectric measurements with a Lange Universal colorimeter. Optimum conditions for resin fixation are attained with a 6% (I) solution and a 1: 0.5 molar ratio of resin to acid, at 60° C. and pH 4. The preliminary aging then occurs within about a half hour and the wet strength of the sheet is about 20% of that of the dry paper. When this aging is carried out at 20° C., a similar result was obtained after 18 hours. The final stage in producing wet-strength paper after impregnation with aged (I) requires a long period for the formation of a hydrophobic polymer which is contingent on pH and temperature. For a given resin solution and acid concentration, the sorption of (I) is more rapid when the acid is added one hour after solution than when added after the solution has stood for 24-96 hours (because of overacidification). The effects on the aging process obtained by varying the hydrochloric acid concentration, by adding formic, citric, phosphoric, or sulfuric acid (in place of hydrochloric acid), by incorporating glycol in the acid-resin mixture, and by using a mixture of aged and fresh (I) solution, are described in detail. The capacity of a pulp for impregnation with (I) is a function of the specific surface and is contingent on the amorphous areas, especially the hemicelluloses, in the fiber. In conclusion, methods of application and their effect on the resulting properties of the tested papers are described. Present and possible future uses are indicated. 16 tables, 15 figures, and 88 references. L.E.W.

ORR, D. B. The possibilities of wet strength papers. Paper Box Bag Maker: 200 (November, 1949).

Wet-strength paper which, when wet, retains 30 to 50% of its dry strength, is valuable for making maps and charts, shopping bags, and other packages. Although it is not waterproof, a high degree of waterproofness is obtained if two layers are laminated with an intermediate layer of bitumen. 1 illustration. J.A.B.

WOOD

HOLZER, W. F. The chemical utilization of wood. Newsprint Service Bur. Bull. no. 383: 2-3, 5 (December, 1949); no. 384: 2-3 (January, 1950).

In the chemical utilization of wood, by far the most important position is occupied by pulp, paper, and board. In this field, there are three major opportunities of extending the natural wood resources: (1) improvement in recovery of the raw material (prelogging and relogging, thinnings, sawmill waste, low-grade wood, and utilization of new species); (2) increase of

yield by means of pulping processes (Asplund process, neutral sulfite process, and refining in hot kraft black liquor); and (3) utilization of waste and by-products of the processes (utilization of sulfite waste liquor and alkali lignins and the use of bases other than calcium base). In conclusion, the urgent need for fundamental research on lignin is emphasized. 28 references.
E.S.

WOOD—MENSURATION

WORTHINGTON, NORMAN P., and TWERDAL, MELVIN P. Contents of a cord of 8-foot pulpwood. Pulp & Paper 24, no. 1: 74, 76, 79 (January, 1950).

The use of pulpwood in 8-foot cordwood lengths is steadily increasing in the Pacific Northwest. Cordwood is purchased in a round unpeeled condition and usually measured in terms of cubic-foot volume of stacked wood and then converted to standard cords of 128 cubic feet. The amount of solid wood per cord in a stack of round unpeeled cordwood is always less than this maximum. The actual wood content is affected (*a*) by closeness of stacking, straightness or roughness of sticks, and scaling practice employed, and (*b*) by stick diameter, the number of pieces in the stack, and bark thickness. A study of the factors in the second group was conducted during some typical summer operations with Douglas fir (I) and hemlock (II) to determine the allowance which should be made for these factors. The details of the method and calculations employed are outlined. The results show that bark volume amounted to approximately 11.1% of the total volume of wood and bark in (I) and 10.8% in (II). The Scribner log-volume equivalents ranged from an extreme of 365 bd.ft./cord at 8 inches average diameter to 650 bd.ft./cord at 20 inches diameter. At any given diameter, (I) and (II) have nearly the same board-foot volume per cord. The estimated green weight of a cord of pulpwood varied from 4300 to 5350 pounds, depending upon species and bolt size. (II) is significantly heavier than (I). Board-foot: cubic-foot ratios for (I) and (II) are substantially the same, reflecting their close approximation in both cubic-foot and board-foot volumes. 2 tables and 3 figures.
E.S.

WOOD—SACCHARIFICATION

OREL, RODOLPHE. The industrial problem of hydrolyzing cellulosic materials. Chimie & Industrie 62, no. 6: 555-69 (December, 1949). [In French]

A detailed analysis is made of the technological and economic aspects of wood hydrolysis. Although no specific literature references are given, the hydrolysis techniques which are indicated appear to be those of G. Meunier, and the calculations and conclusions are those of the present author. A schematic diagram is given of the equipment required in this hydrolysis. The wood used was pine (species not given). Graphs indicate the formation and destruction of sugars with time, sugar yields as a function of the acid catalyst used (using a maximum temperature of 175° C. and a hydrolysis period of 23-52 minutes), total acidity of the hydrolyzates, etc. The author discusses at length the quantitative thermal and energy balance sheets in operations involving hydrolysis → neutralization → fermentation → distillation of alcohol (as well as furfural and methanol), and in the formation of sodium acetate and formate. The steam and water requirements are also treated. The optimum alcohol yields and production costs are discussed at some length. 12 figures.
L.E.W.

WOOD OPERATIONS

GROOME, E. S. Brush disposal. Pulp Paper Mag. Can. 50, no. 13: 132, 134 (December, 1949).

Experiments with brush-disposal methods in the northern clay-belt area of Ontario are described. Brush disposal reduces the dangerous fire hazard which exists for several years after cutting operations with both beneficial and detrimental effects to regeneration. Cost statistics reveal that the cheapest method is the employment of two crews, one for logging and the other for disposing of the brush; weather and construction of piles influence the cost of burning. E.S.

McCOLL, B. J. Cable yarding. Pulp Paper Mag. Can. 50, no. 13: 118-20, 122, 124, 126, 128, 130 (December, 1949).

The history, general characteristics, and the nomenclature of cable yarding are reviewed. The essential features of methods used in eastern Canada are described. A summary of present industrial experience is given and the more general data on the results obtained by five companies are tabulated. Necessary developments are outlined which are required to make the cable-yarding methods in eastern Canada successful and to permit further reductions in operating costs. 1 table. E.S.

WOOD WASTE

BOWERS, HAROLD E. New methods for treatment and use of wood waste. Paper Trade J. 130, no. 1: 29-31 (Jan. 5, 1950).

Several developments resulting from the research fellowship for utilizing white-pine waste established by the New England Box Co. at the Mellon Institute are reviewed; they include a reconstructed wood prepared from a wood-starch molding composition; a low-density insulating material made from wood fiber and a sublimable solid, such as naphthalene, as an extender; a superfine wood flour prepared in a fluid-energy mill; a waterproofing formaldehyde-vapor treatment of the starch-bonded boards; and an electrostatic method for the separation of bark from sawdust. E.S.

WOOL

SCHIEFER, HERBERT F., and KRASNY, JOHN F. Note on the disintegration of wool in abrasion tests. Textile Research J. 19, no. 12: 802-9 (December, 1949).

The coating which formed on the abradant when a specimen of wool fabric was abraded and caused the rate of abrasion to increase approximately 10 times in three successive tests was examined critically. Microchemical analyses showed that it had the same composition as the unabraded fabric. Infrared absorption curves of the coating and of the powder of the unabraded fabric, ground in a vibratory ball mill, showed the same absorption characteristics. Electron micrographs of the coating showed that it contained extremely small particles, many of which were approximately spherical in shape and about 100 to 200 A. in size. Similar particles were observed in the abraded debris when the specimen was kept wet with water during the abrasion test, and also in the powder into which the unabraded fabric was ground in the vibratory ball mill. It was concluded that the coating which formed on the abradant consisted of extremely small particles of wool which appear to correspond in shape and size to the elemental structural units (keratin molecules) proposed in recent concepts of the structure of wool. 1 table, 9 figures, and 6 references. E.S.

Patent Section

Although the abstracts of the United States patents are prepared from the patents themselves, the initial selection of the patents to be abstracted is made from the Patent Gazette *and, therefore, it is possible that the patent section will not contain all patents of potential interest to the industry. The abstracts of the Canadian patents are prepared from the claims published in the* Canadian Patent Office Record. *In so far as possible, an attempt will be made to indicate patents issued in both countries.*

The patent abstracts are listed under the various headings currently used for the abstracts of periodical articles.

Printed copies of United States patents can be obtained from the Commissioner of Patents, Washington, D.C.; the price is 25 cents per copy. Canadian patents up to and including December, 1948, are available only as manuscripts or photostatic copies and an estimate of the cost of a patent should be obtained from the Commissioner of Patents, Ottawa, Canada, in advance of the order. With January, 1949, printed copies of Canadian patents are available at 25 cents per copy of less than 50 sheets of printed matter. For patents of 50 sheets or over, the price is $1.00 per copy. Until the printing branch is in full operation and up to date, the printing of specifications will be several months behind.

ALKALINE PROCESSES—RECOVERY

GAGLIARDI, EMILIO A. J., MELLOR, CHARLES, and HAMM, ALEXANDER L. Smelting process of recovering chemicals from the black liquor derived in pulp mills. U. S. patent 2,495,248. Filed Aug. 8, 1946. Issued Jan. 24, 1950. 3 claims. Hamm's interest assigned to Combustion Engineering-Superheater Inc. [Cl. 23-48]

A continuous smelting process is described for the treatment of black liquor from which the soap has been removed; a low-ash, sulfur-containing, pulverized coke is mixed with the black liquor and salt cake prior to their introduction into the furnace. The coke serves to compensate for the loss in heating value resulting from the removal of the soap, and contributes to the sulfur content of the smelt. E.G.S.

ASPLUND PROCESS

WALTER, HENRY E. Manufacture of fibrous products deriving from lignocellulose. Canadian patent 462,742. Filed Aug. 3, 1940. Issued Jan. 24, 1950. 14 claims. Assigned to Wood Conversion Company.

This is equivalent to U. S. patent 2,454,534; *cf.* B.I.P.C. 19: 287. E.G.S.

WALTER, HENRY E. Manufacture of fibrous products deriving from lignocellulose. Canadian patent 462,743. Filed Aug. 3, 1940. Issued Jan. 24, 1950. 22 claims. Assigned to Wood Conversion Company.

This is the same as U. S. patent 2,454,533; *cf.* B.I.P.C. 19: 286. E.G.S.

WALTER, HENRY E. Manufacture of fibrous products deriving from lignocellulose. Canadian patent 462,744. Filed Aug. 3, 1940. Issued Jan. 24, 1950. 14 claims. Assigned to Wood Conversion Company.

This is equivalent to U. S. patent 2,454,532; *cf.* B.I.P.C. 19: 287. E.G.S.

BARKERS AND BARKING

SWIFT, FRANK H. Hydraulic barker. U. S. patent 2,480,889. Filed Nov. 16, 1946. Issued Sept. 6, 1949. 4 claims. Assigned to Crown Zellerbach Corporation. [Cl. 144-208]

A hydraulic barker is provided with a moving debarking nozzle for use on longitudinally moving slabs; the jet from the nozzle moves over the slabs obliquely with respect to their line of movement; the two directional movements cause the debarking jet to cut a path perpendicular to the line of movement of the slabs. E.G.S.

BLACK LIQUOR

BUCKLEY, WALTER D., and MCCOY, PAUL E. Waterproof concrete composition. U. S. patent 2,483,806. Filed Sept. 18, 1946. Issued Oct. 4, 1949. 10 claims. Assigned to Stancal Asphalt & Bitumuls Company. [Cl. 106-96]

An oil-in-water bituminous emulsion is adapted for use in making waterproof Portland cement, gypsum plaster, and the like. The emulsion consists of 50-70% by weight of a water-insoluble, water-dispersible, high-molecular weight, thermoplastic organic material dispersed in 20-50% of water and containing 0.25-2.0% of a high-molecular weight, pure lignin derivative of sulfate black liquor. The lignin derivative is water-insoluble, soluble in aqueous caustic solutions, and free of ash, water-soluble alkali metal salts, and low-molecular weight organic compounds. The emulsion has a pH of 4.0-7.5. E.G.S.

BLEACHING—GROUNDWOOD

ADAMS, DANIEL O., and HUGHEY, GEORGE B. Hypochlorite bleaching of ground wood. Canadian patent 462,416. Filed Feb. 6, 1948. Issued Jan. 10, 1950. 5 claims. Assigned to West Virginia Pulp and Paper Company.

A method is given for the hypochlorite bleaching of groundwoods which are rich in tannin and color bodies (e.g., oak, chestnut, chestnut oak, maple, etc.); the tannin and color bodies are removed with a dilute aqueous caustic solution at a temperature below the boiling point of the solution, following which the extracted groundwood is treated with an alkaline hypochlorite solution containing 10-15% of available chlorine (based on the dry groundwood). E.G.S.

ADAMS, DANIEL O., and HUGHEY, GEORGE B. Peroxide bleaching of ground wood. Canadian patent 462,415. Filed Feb. 6, 1948. Issued Jan. 10, 1950. 3 claims. Assigned to West Virginia Pulp and Paper Company.

This is the same as U. S. patent 2,435,566; *cf.* B.I.P.C. 18: 483. E.G.S.

BLEACHING—SULFATE

CASCIANI, FERRI, and STORIN, GORDON K. Method of bleaching pulp. U. S. patent 2,494,542. Filed May 2, 1946. Issued Jan. 17, 1950. 6 claims. Assigned to Niagara Alkali Company. [Cl. 8-106]

This is similar to Canadian patent 448,883; *cf.* B.I.P.C. 18: 801-2. E.G.S.

BOARD

EVANS, RAYMOND N., and INGRASSIA, ANGELO P. Lignin resins and process of making same. U. S. patent 2,494,545. Filed April 20, 1946. Issued Jan. 17, 1950. 6 claims. Assigned to Masonite Corporation. [Cl. 260-17.5]

An acid- and alkali-resistant resin is prepared from lignin and polymerized furfuryl alcohol; a fibrous product (e.g., hardboard, concrete-form liners, drain boards, etc.), which is resistant to the absorption of water may be prepared by mixing the resin with acid-hydrolyzed lignocellulose fibers. E.G.S.

BOARD, FIREPROOF

JACOBS, MAURICE. Coating composition having fireproof properties. Canadian patent 462,588. Filed Feb. 9, 1943. Issued Jan. 17, 1950. 19 claims. Assigned to Albert W. Clurman (as trustee).

This corresponds to U. S. patent 2,438,339; *cf.* B.I.P.C. 18: 641. E.G.S.

BOARD, LAMINATED

HICKLER, WALTER R. Method of manufacturing a resin-bonded composite product. U. S. patent 2,456,006. Filed Sept. 27, 1943. Issued Dec. 14, 1948. 4 claims. Assigned to The B. F. Goodrich Company. [Cl. 154-132]

A resin-bonded composite product comprises a core member of resin-impregnated cotton fibers, an intermediate sheet of resin-impregnated paper, and a surface layer of wood veneer. The cotton fibers are impregnated with a slow-curing, thermosetting resin, and the paper sheet with a fast-curing, thermosetting resin. E.G.S.

WILLEY, GRANT S., and RUTHMAN, KENNETH S. Laminated product and process of making same. U. S. patent 2,495,043. Filed Oct. 8, 1943. Issued Jan. 17, 1950. 21 claims. Assigned to United States Gypsum Company. [Cl. 154-133]

A hardboard about 0.064-inch thick is made from individual sheets of paper. A suitable paper is first made from a paper furnish containing about 85% (dry weight) of what is known as "No. 2 old books," which is primarily derived from groundwood pulp; the paper furnish also contains about 15% of waste kraft paper. After suitable beating the pulp is sized with about 3% of rosin size set with about 1% of ferric sulfate (all based on the dry pulp weight). A paper which weighs about 80 lb./1000 sq.ft. is prepared from the pulp. A similar batch of paper is made which contains about 6% of a pigment (e.g., red oxide), which is added to the pulp prior to the addition of the ferric sulfate precipitant; the colored stock is made into paper weighing about 30 lb./1000 sq.ft. The colored paper is intended to constitute the outer surface of the ultimate product. A sufficient amount of 1% ferric sulfate

solution is applied to the uncolored sheets to give a coverage of 0.04 gram of ferric sulfate/sq.ft. on each side of the sheet. The colored sheets are similarly coated, but only on the side which is intended to be on the inside. The sheets are then collated, using four sheets of uncolored paper and at least one surface sheet of colored paper, the latter with the untreated side outward. The resulting assembly is pressed between the heated platens (470° F.) of a press; the pressure is increased from 100 to 2000-2500 p.s.i. in 2 to 2.5 minutes. The resulting sheet has a density of 72 lb./cu. ft. and a modulus of rupture of about 8130 lb./sq.in. E.G.S.

BOARD DRYING

HEINO, ARNE W. Manufacture of bonded fiber mats. U. S. patent 2,493,194. Filed Nov. 29, 1946. Issued Jan. 3, 1950. 15 claims. Assigned to Wood Conversion Company. [Cl. 154-29]

A mechanism is described for transferring an undried, bonded, low-density fiber mat from a forming belt to a drying belt; the undried mat is removed from the forming belt by being bounced in transit. E.G.S.

BOARD SPECIALTIES

BAILAR, CHARLES O., and SPALDING, THOMAS L. Tray. U. S. patent 2,470,456. Filed Jan. 7, 1947. Issued May 17, 1949. 2 claims. Assigned to Marathon Corporation. [Cl. 229-30; changed to 206-45.14]

A setup carton is adapted for bakery rolls, doughnuts, and the like; a cellophane wrapper surrounds and protects the carton and its contents. E.G.S.

DE SWART, JAN. Bottle carrier. U. S. patent 2,472,005. Filed Dec. 12, 1944. Issued May 31, 1949. 11 claims. Assigned to Shellmar Products Corporation. [Cl. 224-45]

A cardboard bottle carrier engages and supports the necks of several bottles in such a manner that the bottles are restrained against accidental release. E.G.S.

ELLERN, HERBERT. Methods and materials for stiffening paper match splints. U. S. patent 2,495,575. Filed March 7, 1947. Issued Jan. 24, 1950. 1 claim. Assigned to Universal Match Corporation. [Cl. 52-26]

A stiffening impregnant for cardboard matches has the following composition: white paraffin, 67%; limed rosin (4.75% calcium hydroxide), 15%; opal wax, 7%; and carnauba wax, 11%. E.G.S.

EPPS, THOMAS B. Storage and display box. U. S. patent 2,457,812. Filed June 14, 1945. Issued Jan. 4, 1949. 3 claims. [Cl. 206-45.13]

A cardboard storage and display box incorporates an easel which may be elevated to support an article of merchandise; when not in use, the easel may be folded into the bottom of the box. E.G.S.

GEORGE, WALTER C., and KLASING, ARTHUR P. Process of manufacturing collapsible cellular container partitions. U. S. patent

2,494,437. Filed July 30, 1948. Issued Jan. 10, 1950. 6 claims. Assigned to Gaylord Container Corporation. [Cl. 93-37]

A collapsible 24-cell container partition is formed from eight webs of fiberboard, corrugated board, or other suitable material; the partition may be shipped flat and set up for use. E.G.S.

GERSTEN, LEE. Cabinet, chest, and similar articles. U. S. patent 2,451,211. Filed April 24, 1947. Issued Oct. 12, 1948. 7 claims. [Cl. 229-23]

A paperboard cabinet, chest, wardrobe, or container incorporates a locking joint which anchors the end members to the body portion of the container. E.G.S.

GITTENS, SIDNEY R. Display card and package. U. S. patent 2,471,321. Filed Aug. 2, 1945. Issued May 24, 1949. 5 claims. [Cl. 206-79]

A combination display card and package for wire-screen patches consists of a cardboard strip which is folded around the patches and stapled. E.G.S.

HORNING, RAYMOND H. Container closure. U. S. patent 2,493,671. Filed Dec. 4, 1946. Issued Jan. 3, 1950. 5 claims. Assigned to Oswego Falls Corporation. [Cl. 229-5.5]

The flanged closure of a paperboard milk container is coated with a heat-sealable thermoplastic adhesive for sealing the flange to the body of the container upon the application of heat and pressure. E.G.S.

HULTIN, OSCAR H. Package and method of making the same. U. S. patent 2,494,177. Filed March 16, 1946. Issued Jan. 10, 1950. 1 claim. Assigned to Pneumatic Scale Corporation, Limited. [Cl. 206-45.34]

A display package consists of a rectangular cellophane bag overwrapped with a strip of cardboard, so that the contents of the package are visible from the front and back sides. E.G.S.

KIDD, JOHN W. Carton. Canadian patents 462,374, 462,375, and 462,376. Filed May 11, 1949. Issued Jan. 10, 1950. 5, 4, and 3 claims. Assigned to Hygrade Corrugated Products Limited.

The center longitudinal partition of a multicompartment container projects above the top of the carton to form a carrying handle. E.G.S.

MCFALL, WILLIAM W. Shirt packaging device. U. S. patent 2,458,998. Filed Nov. 9, 1945. Issued Jan. 11, 1949. 9 claims. [Cl. 223-71]

An integral cardboard shirt-packaging device incorporates a reinforcing base or backing panel, and a collar-protecting panel. E.G.S.

PFEIL, ERNEST W. Hat holder. U. S. patent 2,494,488. Filed Sept. 12, 1947. Issued Jan. 10, 1950. 4 claims. [Cl. 211-32]

A cardboard hat holder is provided with bendable lips on both sides of

a hat-supporting yoke, so that different sizes of hat crowns can be accommodated. E.G.S.

PFEIL, ERNEST W. Portable hat holder. U. S. patent 2,494,487. Filed Oct. 12, 1946. Issued Jan. 10, 1950. 1 claim. [Cl. 211-32]

A collapsible, portable cardboard hat holder is adapted to be attached to a closet door or wall. E.G.S.

RITTER, SAUL. Watch band display package. U. S. patent 2,470,370. Filed Nov. 15, 1945. Issued May 17, 1949. 2 claims. [Cl. 206-78]

A cardboard display package for expansion-type watch bands has a pocket or recess which conforms to the shape of the band. E.G.S.

RUECKERT, DEAN E. Packaging food products. U. S. patent 2,470,579. Filed Jan. 19, 1946. Issued May 17, 1949. 5 claims. Assigned to Swift & Company. [Cl. 99-174; changed to 99-175]

A package for frankfurters, sausages, and the like incorporates a piece of solid sulfite or bleached manila-lined board as a backing sheet. E.G.S.

SHERBONDY, WILLIAM A. Holder for carfare tokens. U. S. patent 2,459,292. Filed May 2, 1945. Issued Jan. 18, 1949. 1 claim. [Cl. 206-56]

A cardboard folder is adapted to hold bus tokens, coins, buttons, medicine tablets, and the like. E.G.S.

STEINMAN, ALEXANDER S. Collar support. U. S. patent 2,494,675. Filed July 3, 1947. Issued Jan. 17, 1950. 3 claims. Assigned one half to Nathan Steinman. [Cl. 223-83]

A cardboard strip is inserted between the inner and outer folds of a shirt to reinforce the collar. E.G.S.

VON LIEDTKE, RUDOLPH H. Method of impregnating fibrous articles. Canadian patent 462,664. Filed Feb. 7, 1946. Issued Jan. 24, 1950. 2 claims. Assigned to Canadian Line Materials, Limited.

This is the same as U. S. patent 2,478,439; *cf.* B.I.P.C. 20: 54-5. E.G.S.

YARMAN, PAUL J. Loading pallet. U. S. patent 2,493,562. Filed April 4, 1947. Issued Jan. 3, 1950. 5 claims. Assigned to The Ohio Boxboard Company. [Cl. 248-120]

A loading pallet incorporates a double-faced corrugated board platform which is supported by compact paperboard spacer blocks. E.G.S.

CHLORINE

WALLACE, CHARLES F. Chlorine concentration limit indicator for chlorinating systems. U. S. patent 2,482,078. Filed July 13, 1946. Issued Sept. 13, 1949. 3 claims. Assigned to Wallace & Tiernan Products, Inc. [Cl. 346-33]

A recording chlorine concentration limit indicator is adapted for use in

connection with a chlorine injection system for the chlorination of aqueous liquids. E.G.S.

CHLORINE DIOXIDE

ASTON, ROYDEN N. Solid, stable chlorine dioxide generating compositions. U. S. patent 2,482,891. Filed March 16, 1945. Issued Sept. 27, 1949. 5 claims. Assigned to Mathieson Chemical Corporation. [Cl. 252-187]

This is the same as Canadian patent 457,261; *cf.* B.I.P.C. 19: 819. E.G.S.

BOOTH, GEORGE M. Manufacture of chlorine dioxide. U. S. patent 2,459,124. Filed Oct. 20, 1947. Issued Jan. 11, 1949. 9 claims. Assigned to Novadel-Agene Corporation. [Cl. 23-152]

Chlorine dioxide is prepared by the reaction of nitrogen trichloride with sodium chlorite. E.G.S.

DE-INKING

RUFF, HAROLD T., and STEVENSON, JAMES F., JR. Fibrous furnish and method of preparing the same. Canadian patent 462,696. Filed June 21, 1946. Issued Jan. 24, 1950. 11 claims. Assigned to The Mead Corporation.

A process is described for deinking and bleaching groundwood-containing waste paper. The waste paper is treated with a hot caustic soda solution containing the equivalent of 2-3% of sodium hydroxide (based on the airdry waste), to remove or loosen the ink from the fibers; the treated material is defibered, washed, and bleached at a consistency of 4-8% in a solution of sodium or calcium hypochlorite, which is buffered with sodium hydroxide to a pH of 8 to 11. Sufficient hypochlorite is added to provide 2.5-7% chlorine. The bleached brightness of the material is 65-70. E.G.S.

DISPENSING CONTAINERS

AYRE, JOHN A. Dispensing carton. Canadian patent 462,153. Filed Oct. 3, 1947. Issued Jan. 3, 1950. 4 claims.

A dispensing carton is adapted to be hung on a wall; a displaceable portion of the cover forms a dispensing opening at the lower end of the supported carton. E.G.S.

MOORE, GEORGE A. Slide dispensing package with reinforced wrapper. U. S. patent 2,494,446. Filed Sept. 21, 1944. Issued Jan. 10, 1950. 7 claims. Assigned to National Biscuit Company. [Cl. 206-45.33]

A slide dispensing package for bakery products is adapted to hold individual cookies or cakes in compartments or to receive a dump-filled material; the package may be opened for the removal of part of its contents and then reclosed. E.G.S.

YOUNGHUSBAND, JAMES L. Powder box. U. S. patent 2,494,151. Filed Dec. 6, 1947. Issued Jan. 10, 1950. 1 claim. [Cl. 229-43]

A cylindrical cardboard powder box incorporates a laminated paper seal-

ing disk in the top of the box, which prevents the powder from sifting from the container. E.G.S.

FOLDING BOXES

BROEREN, FRANK L., WAUDA, GEORGE E., and KUEHL, ROBERT. Frozen food package. U. S. patent 2,470,465. Filed July 26, 1946. Issued May 17, 1949. 7 claims. Assigned to Marathon Corporation. [Cl. 99-192]; Canadian patent 462,887. Filed April 21, 1949. Issued Jan. 31, 1950. 7 claims. Assigned to Marathon Corporation.

A carton is adapted for the packaging of foods which are subject to dehydration when stored at temperatures below 30° F. The package is provided with a pad of absorbent material which can be moistened or saturated with water and which will provide a seal for the package when frozen and act as a reservoir from which the surrounding air can withdraw moisture. E.G.S.

BUTTERY, KENNETH T. Covered box or container. U. S. patent 2,493,338. Filed April 16, 1947. Issued Jan. 3, 1950. 10 claims. Assigned to Sutherland Paper Company. [Cl. 229-36]

The body end walls of a covered box or container are provided with diagonal weakening lines which form joint flaps at the front ends of the walls; the joint flaps are collapsible on the outside of the end walls, and the corner flaps are adhesively secured to the front wall. E.G.S.

BUTTERY, KENNETH T. Lined carton or container. U. S. patent 2,493,337. Filed Oct. 25, 1945. Issued Jan. 3, 1950. 5 claims. Assigned to Sutherland Paper Company. [Cl. 229-14]

A moistureproof or waterproof liner is adhesively secured to the walls of a container in such a manner that the liner is opened or erected when the walls are erected. E.G.S.

FRANKENSTEIN, WILLIAM P. Carton. U. S. patent 2,493,189. Filed Aug. 20, 1945. Issued Jan. 3, 1950. 10 claims. [Cl. 229-34]

A hollow-walled knocked-down carton is provided with fold or score lines which may be broken prior to setting up. E.G.S.

FRANKENSTEIN, WILLIAM P. Carton. U. S. patent 2,494,234. Filed Nov. 29, 1946. Issued Jan. 10, 1950. 15 claims. [Cl. 229-34]

A hollow-walled carton embodies a step or shoulder portion either inside or outside the carton; the invention represents a modification of U. S. patent reissue 21,158, issued July 25, 1939, and U. S. patent 2,397,934, issued April 9, 1946. E.G.S.

LEWIS, ALBERT M., and WEILER, PETER B. Collapsible box. U. S. patent 2,470,174. Filed Dec. 22, 1947. Issued May 17, 1949. 5 claims. [Cl. 229-41]

A collapsible cardboard box embodies a wire reinforcing frame which is mounted around the upper edge of the box. E.G.S.

WHITEHEAD, EARL B. Carton blank. U. S. patent 2,493,176. Filed Jan. 9, 1948. Issued Jan. 3, 1950. 2 claims. Assigned to Atlantic Carton Corporation. [Cl. 229-33]

The cover of a preformed paper carton is provided with locking tabs for holding the cover closed. E.G.S.

MACHINERY—BEATERS

STEPHANSEN, ERIK. Beating apparatus. Canadian patent 462,587. Filed Dec. 1, 1947. Issued Jan. 17, 1950. 7 claims. Assigned to Otto Imset (Papirindustriens Forskningsinstitutt); *cf.* B.I.P.C. 19: 107-8.

A beater consists of a roller and a casing which rotate in the same direction, but independently; their rotational speeds may be adjusted separately to obtain the desired relative peripheral speed. E.G.S.

MACHINERY—CONVERTING MACHINERY

ANDERSON, NELS A. Rotary die creasing mechanism for corrugated paperboard. U. S. patent 2,475,868. Filed April 13, 1945. Issued July 12, 1949. 7 claims. Assigned to Fiberboard Products Inc. [Cl. 93-58.1]

An apparatus is described for the roller-die creasing of corrugated paperboard. E.G.S.

GODWIN, JOSEPH F. Method and apparatus for forming cellular structures. U. S. patent 2,493,243. Filed March 26, 1946. Issued Jan. 3, 1950. 12 claims. [Cl. 93-37]

A method and apparatus are provided for assembling slotted corrugated board partitions to form a cellular unit. E.G.S.

HOLLIS, ROBERT F. Adjustable anvil. U. S. patent 2,470,487. Filed April 13, 1944. Issued May 17, 1949. 2 claims. Assigned to Alton Box Board Company. [Cl. 93-55.1; changed to 93-1]

A radially adjustable anvil is adapted to the manufacture of protective paper rings for bombs, barrels, pipe, and the like. E.G.S.

INMAN, WILLIAM H. Carton folding machine. Canadian patent 462,482. Filed Aug. 6, 1947. Issued Jan. 17, 1950. 16 claims. Assigned to Bloomer Bros. Company.

A carton-folding machine is designed to fold blanks to form fluid-tight containers. E.G.S.

MUELLER, WILLIAM G., KLAUSE, KARL, and MEIER, ANTON M. Apparatus for positioning cores. U. S. patent 2,493,590. Filed Oct. 22, 1947. Issued Jan. 3, 1950. 15 claims. [Cl. 214-17]

A device is provided for accurately positioning a short tubular core on a rewinder shaft; if the continuous sheet material (e.g., waxed paper, toilet tissue, textiles, regenerated cellulose, or metal foil) is to be wound on cores having square or polygonal cross sections, the trough, core-stop face, and rewinder shaft are given corresponding contours. E.G.S.

MACHINERY—CORRUGATING MACHINE

BRUKER, HOBART W. Siphon apparatus for heated rolls. U. S.

patent 2,460,059. Filed Sept. 11, 1946. Issued Jan. 25, 1949. 4 claims. Assigned to George W. Swift, Jr., Inc. [Cl. 34-125]

A siphon is adapted to exhaust the condensate from the steam-heated rolls used in paper-corrugating machinery. E.G.S.

ECKSTEIN, KARL J. Continuous corrugating mechanism. U. S. patent 2,494,431. Filed June 28, 1945. Issued Jan. 10, 1950. 15 claims. [Cl. 154-30]

A continuous corrugating machine for paper and paperboard includes stationary interfitting guides which are arranged so that the travel of the paper web is correlated with the shape and arrangement of the guides; thus, smooth, uniform corrugations are produced without stressing or rupturing the web. E.G.S.

MACHINERY—CREPING MACHINE

DORST, PAUL W. Process of and apparatus for making longitudinally and laterally stretchable creped webs. U. S. patent 2,494,334. Filed July 29, 1946. Issued Jan. 10, 1950. 17 claims. Assigned to Cincinnati Industries, Inc. [Cl. 154-33.05; changed to 154-30]; Canadian patent 462,838. Filed July 14, 1947. Issued Jan. 31, 1950. 17 claims. Assigned to Cincinnati Industries, Inc.

A means and method are provided for accurately controlling the degree of stretchability imparted to a creped paper web. A web is adhered to a creping surface and is moved relatively to a transverse creping doctor; as the doctor is simultaneously moved in the direction of the extent of its working edge, the web is contracted or crinkled, but at the same time is progressively displaced laterally in such a manner that it tends to go off at an angle; the angle can be adjusted by varying the relative speeds of the knife or doctor and the web. E.G.S.

ROWE, WILLIAM W. Creping corrugated papers. U. S. patent 2,494,723. Filed Feb. 8, 1947. Issued Jan. 17, 1950. 8 claims. Assigned to Cincinnati Industries, Inc. [Cl. 154-33.05; changed to 154-30]

An apparatus is designed to crepe and corrugate a paper web in a unitary operation. E.G.S.

MACHINERY—CUTTERS

FOURNESS, CHARLES A., and COLLINS, HOWARD A. Severing wadding material to form sanitary napkin pads. Canadian patent 462,244. Filed Oct. 19, 1946. 6 claims. Assigned to International Cellucotton Products Company.

Wadding for sanitary napkins is severed by a series of piercing actions. E.G.S.

PERKINS, HIRAM A. Web feeding and cutting machine. U. S. patent 2,471,447. Filed Sept. 2, 1944. Issued May 31, 1949. 3 claims. Assigned to Setter Bros. Inc. [Cl. 164-84.5]

A machine is provided for feeding, cutting, and tearing a continuous paper

web into sections of uniform dimensions. This patent represents a continuation of U. S. patent 2,357,846, which issued Sept. 12, 1944. E.G.S.

RICHARDSON, RALPH R., and EDMONDSTON, WILLIAM H. Sheeting method and apparatus. Canadian patent 462,723. Filed July 19, 1946. Issued Jan. 24, 1950. 2 claims. Assigned to United Biscuit Company.

A method and an apparatus are described for cutting box blanks from a continuous web of sheet material. E.G.S.

SURPRENANT, JOSEPH L. Paper cutting machine. Canadian patent 462,455. Filed Nov. 20, 1946. Issued Jan. 17, 1950. 8 claims.

A paper cutting machine incorporates rotary and fixed cutting blades which co-operate to cut a paper web as it passes between them. E.G.S.

MACHINERY—DRYERS

DUNGLER, JULIEN. Nozzle member used for the drying of textile and other materials. U. S. patent 2,492,974. Filed April 30, 1947. Issued Jan. 3, 1950. 1 claim. [Cl. 34-156]

A paper or textile drier is provided with hot-air nozzles which are arranged so that the air streams are directed at acute and right angles with the surface of the product. E.G.S.

MACHINERY—FOLDING MACHINE

LA COUR, EDGAR J. Apparatus for folding paper sheets. U. S. patent 2,493,410. Filed Sept. 7, 1945. Issued Jan. 3, 1950. 2 claims. Assigned to Orchard Paper Company. [Cl. 270-68; changed to 270-61]

The tangential rolls of a paper-folding device incorporate sections of highly frictional material on their peripheries in order to engage the bottom sheet of a stack and draw it between the rolls. E.G.S.

MACHINERY—GUIDE ROLLS

KARLSSON, KARL A. Wire guide for papermaking machines. U. S. patent 2,494,245. Filed April 8, 1946. Issued Jan. 10, 1950. 6 claims. [Cl. 74-241]

A wire guide for papermaking machines includes a pendulum system which acts to restore the wire to its normal position after it has been displaced laterally. E.G.S.

MACHINERY—HEAD BOX

GOODWILLIE, JOHN E. Stock inlet. Canadian patent 462,646. Filed Nov. 7, 1946. Issued Jan. 24, 1950. 13 claims. Assigned to Beloit Iron Works.

A stock chamber is provided with rectifier rolls and baffles which divide the chamber into a number of compartments between the inlet and outlet; the flow passages between the compartments are of progressively decreasing size, so that the stock is fed from the outlet at high velocity. E.G.S.

MACHINERY—JOGGERS

WEYANDT, CARL S. Paper jogger. U. S. patent 2,494,075. Filed March 18, 1946. Issued Jan. 10, 1950. 3 claims. [Cl. 271-89]

The horizontal deck of a paper jogger vibrates in such a manner that two edges of a stack of paper are jogged simultaneously, thus avoiding the necessity of turning the stack. E.G.S.

MACHINERY—PACKAGING MACHINERY

BURBANK, WENDELL T. Method of wrapping and labeling receptacles. U. S. patent 2,469,366. Filed Sept. 8, 1947. Issued May 10, 1949. 14 claims. Assigned to Sutherland Paper Company. [Cl. 93-3]

A method is provided for wrapping and labeling receptacles such as paper cups; the heat-sealed wrapper encloses and protects the cups, and at the same time permits the nesting of several packages of the cups. E.G.S.

HARTMAN, CARL H., MARSH, ESLI A., and DORRINGTON, NEILL E. Apparatus for closing bags. Canadian patent 462,547. Filed March 6, 1946. Issued Jan. 17, 1950. 21 claims. Assigned to St. Regis Paper Company.

An apparatus is provided for opening and filling paper bags; the patent corresponds to U. S. patent 2,396,262, issued March 12, 1946. E.G.S.

JOHNSON, HENRY A. Method of filling containers and apparatus therefor. U. S. patent 2,493,583. Filed April 27, 1946. Issued Jan. 3, 1950. 3 claims. [Cl. 226-19; changed to 18-55]

A method and apparatus are provided for holding and reinforcing collapsible paperboard containers while filling them with a fluid and allowing the fluid to solidify or freeze. E.G.S.

MACHINERY—PASTING MACHINE

HAAS, FRANK J. Taping machine. U. S. patent 2,495,003. Filed June 3, 1947. Issued Jan. 17, 1950. 7 claims. Assigned to Boxart Machine Company. [Cl. 93-56]

A machine is presented for taping the corner joints of folded paper boxes. E.G.S.

HOWARD, STANLEY R. Adhesive applying mechanism. U. S. patent 2,494,176. Filed Aug. 22, 1947. Issued Jan. 10, 1950. 4 claims. Assigned to Pneumatic Scale Corporation, Limited. [Cl. 91-12]

A mechanism is provided for controlling the amount of adhesive transferred to a continuously moving web of bag-forming material; the adhesive supply roller rotates in a direction opposite to the direction of travel of the web, so that a wiping action is obtained and a uniform film of adhesive is applied. E.G.S.

MACHINERY—PULPERS

WANDEL, KURT. Apparatus for subjecting materials to disintegrating or pulping treatment. Canadian patent 462,456. Filed May 21, 1947. Issued Jan. 17, 1950. 10 claims.

An apparatus is adapted for the defibering of waste paper. E.G.S.

MACHINERY—SCREENS

TRUCHON, RAOUL, and PAGÉ, J. E. LAURENT. Rotary paper screen. Canadian patent 462,150. Filed Nov. 14, 1947. Issued Jan. 3, 1950. 1 claim.

A rotary pulp screen is provided with a sealing system. E.G.S.

MACHINERY—SHEET-FEEDING MECHANISM

MAGNUSSON, JOSEPH. Sheet feeding mechanism. U. S. patent 2,494,186. Filed June 4, 1947. Issued Jan. 10, 1950. 11 claims. Assigned to Pneumatic Scale Corporation, Limited. [Cl. 271-32]

A labeling machine includes means for relieving the weight of an entire stack of labels and releasing only a few labels at the bottom of a magazine; the bottommost label is pneumatically separated from the others and is withdrawn by a suction pad. E.G.S.

MOLDED PULP ARTICLES

CHAPLIN, MERLE P. Manufacturing pulp articles. U. S. patent 2,494,743. Filed April 30, 1942. Issued Jan. 17, 1950. 4 claims. Assigned to Chaplin Corporation. [Cl. 92-56]

A mechanism for forming and finishing molded-pulp bottle caps and hoods incorporates forming, drying, finishing, printing, coating, and transfer dies. E.G.S.

RISCH, ARTHUR H. Pulp decoy. U. S. patent 2,494,631. Filed Sept. 5, 1946. Issued Jan. 17, 1950. 3 claims. Assigned to Pulp Reproduction Company. [Cl. 43-3]

A hollow molded-pulp duck decoy has a bottom opening which is sealed against seepage by a buoyant plate. E.G.S.

PAPER—COATED

BICKNELL, JOHN A. Method of prolonging the useful life of aqueous aluminum-casein coating composition. U. S. patent 2,459,408. Filed Jan. 14, 1946. Issued Jan. 18, 1949. 9 claims. Assigned to S. D. Warren Company. [Cl. 106-146]

A paper coating composition consists of finely divided aluminum, casein, about five parts by weight of sodium pyrophosphate per hundred parts of casein, and sufficient urea to dissolve the casein. E.G.S.

BROMLEY, WILLIAM H., JR. Process for preparing aqueous dispersions of polyvinyl butyral. U. S. patent 2,455,402. Filed Oct. 7, 1947. Issued Dec. 7, 1948. 7 claims. Assigned to Shawinigan Resins Corporation. [Cl. 260-34.2; changed to 260-23]

A paper coating composition is prepared by combining 93 parts of polyvinyl alcohol with 59 parts of butyraldehyde in the presence of 80 parts of ethanol, 2 parts of sulfuric acid, 8.5 parts of oleic acid, and 40 parts of castor oil. The mixture is stirred and heated at 60° C. for two hours. The resulting product comprises a homogeneous solution of polyvinyl butyral in the castor oil and ethanol. The resin solution is agitated and heated at 80° C. until all the unreacted aldehyde and the ethanol are removed. A solution of 2.5 parts of sodium hydroxide in 65 parts of water is slowly added to the plasticized resin; the sulfuric acid catalyst is neutralized, sodium oleate is formed, and the water is dispersed in the resin. Additional water is slowly added until inversion takes place when the water content of the product reaches 25%. The resulting product represents a dispersion of plasticized polyvinyl butyral resin in water. E.G.S.

DUNLOP, RICHARD D. Thermosetting polyvinyl acetal composition. U. S. patent 2,466,399. Filed Oct. 15, 1943. Issued April 5, 1949. 4 claims. Assigned to Monsanto Chemical Company. [Cl. 260-45.1]

A cementing and coating composition for paper, glass, wood, and textiles has the following composition by weight: polyvinyl butyraldehyde acetal resin, 56.3%; butyl ricinoleate, 28.2%; Plasticizer SC (a glycol ester of vegetable oil acids), 9.6%; phenolic resin, 5.6%; and the tetraethyl ether of tetramethylol melamine, 0.3%. E.G.S.

GOLD, LEON J. Thermoplastic coating composition. U. S. patent 2,451,212. Filed Nov. 26, 1945. Issued Oct. 12, 1948. 6 claims. Assigned to Milprint, Inc. [Cl. 106-287; changed to 106-230]

A thermoplastic paper coating composition comprises 10-60% by weight of Norelac, 2.5-30% of a plasticizer (a mixture of *o*- and *p*-toluenëthylsulfonamides), and 0.1-15% of paraffin, all dispersed in a volatile solvent. E.G.S.

HABIB, EMILE E., and GREENLIE, DAVID G. Coating composition containing a fatty acid ester as a gel stabilizing agent. U. S. patent 2,466,672. Filed May 20, 1947. Issued April 12, 1949. 7 claims. Assigned to Dewey and Almy Chemical Company. [Cl. 260-23.5]

A moisture- and vaporproof coating composition for cardboard and paper comprises a mixture of a paraffin wax, a microcrystalline wax, a water-insoluble metal soap (e.g., aluminum stearate), sorbide dioleate, and a compatible organic plasticizer; the composition takes the form of a gel. E.G.S.

HARVEY, MORTIMER T. Reaction products of an aldehyde with allyl ether of anacardic material. U. S. patent 2,460,256. Filed Jan. 8, 1945. Issued Jan. 25, 1949. 13 claims. Assigned to The Harvel Corporation. [Cl. 260-18]

The allyl ether of an anacardic material such as cashew nut shell liquid is prepared by combining 300 parts of cashew nut shell liquid, 100 parts of allyl chloride, and 53 parts of sodium hydroxide dissolved in 150 parts of water. The resulting composition is suitable for the coating and impregnating of paper, cotton, asbestos, wood, and the like. E.G.S.

JUBANOWSKY, LOUIS J. Coating and impregnating composition. U. S. patent 2,494,559. Filed Aug. 17, 1948. Issued Jan. 17, 1950. 11 claims. Assigned to The Baker Castor Oil Company. [Cl. 106-250]

A fusible impregnating and coating composition is a blend of two components. The first component is a saturated monohydric alcohol ester of a fatty acid; the ester has a melting point of at least 50° C. The second component is a nonhydrogenated air-blown polyhydric alcohol ester of unsaturated fatty acids. The composition is suitable for treating paper, asbestos, or leather to render them impervious to mineral oils, aromatic hydrocarbons, and the like. E.G.S.

KROPA, EDWARD L. Emulsions of polymerizable compositions. U. S. patent 2,473,801. Filed April 1, 1939. Issued June 21, 1949. 2 claims. Assigned to American Cyanamid Company. [Cl. 260-29.2; changed to 260-29.6]

An emulsion is prepared by agitating a mixture of styrene and polyethylene glycol maleate resins with an equal weight of water; about 0.4% of benzoyl peroxide is added to the reactive mixture before emulsification. The mixture gels to form a hard resin upon heating at 45-90° C. The emulsion is adapted for the coating and impregnation of paper, fabrics, leather, etc. E.G.S.

NICHOLS, PETER L., JR., and SMITH, LEE T. Resinous compositions of starch ethers with other resins. U. S. patent 2,458,191. Filed Jan. 26, 1945. Issued Jan. 4, 1949. 4 claims. Assigned to the United States of America as represented by the Secretary of Agriculture. [Cl. 260-17.4]

A paper coating composition is prepared by the addition of benzyl or allyl starch (1.4-2.4 allyl groups per glucose unit) to methyl and ethyl acrylate polymers. E.G.S.

ROSENTHAL, FRITZ. Copolymers of styrene and 4,4′-divinylbiphenyl. U. S. patent 2,462,555. Filed Nov. 24, 1945. Issued Feb. 22, 1949. 8 claims. Assigned to Radio Corporation of America. [Cl. 260-86; changed to 260-88.1]

A cross-linked copolymer of 4,4′-divinyldiphenyl and polystyrene constitutes a coating agent for glass, paper, cloth, ceramics, wood, and the like. E.G.S.

WALTER, HENRY A. 3,5-Diamino-4-hydro-thiotriazine-1-dioxide resins. U. S. patent 2,449,520. Filed May 10, 1947. Issued Sept. 14, 1948. 5 claims. Assigned to Monsanto Chemical Company. [Cl. 260-67.6]

The reaction product of 3,5-diamino-4-hydrothiotriazine-1-dioxide, formaldehyde, and methanol is suitable for use as a paper-treating composition, a coating composition, and the like. E.G.S.

YOUNG, DAVID W., and SPARKS, WILLIAM J. Tough, flexible, polyamide resin-hydrocarbon resin compositions. U. S. patent 2,468,534. Filed Nov. 23, 1944. Issued April 26, 1949. 5 claims.

Assigned to Standard Oil Development Company. [Cl. 260-23; changed to 260-32.6]

A styrene-isobutylene copolymer is combined with a high-molecular weight ethylene diamine-dilinoleic acid polyamide resin to produce a coating and impregnating agent for paper, such as glassine. E.G.S.

PAPER—COATED (HOT-MELT)

DUNLOP, RICHARD D. Polyvinyl butyral composition. U. S. patent 2,453,308. Filed July 21, 1943. Issued Nov. 9, 1948. 1 claim. Assigned to Monsanto Chemical Company. [Cl. 260-45.2]

One hundred parts of polyvinyl butyraldehyde acetal resin are combined with 25 parts of dibutyl sebacate and 5 parts of the tetraethyl ether of tetramethylol melamine. A sheet of kraft paper is coated and impregnated with a 20% ethanol solution of the reaction mixture; the ethanol is evaporated by heating the sheet at 75° C. The paper may be heated to 125° C. to set the plastic material; the product is flexible and moisture-resistant. A more dilute ethanol solution may be used to obtain a high-wet strength paper. E.G.S.

GRAHAM, BOYNTON, and TURNER, HOWARD S. Article coated with *N*-alkoxymethyl polyamide and process of making same. U. S. patent 2,443,450. Filed July 1, 1943. Issued June 15, 1948. 12 claims. Assigned to E. I. du Pont de Nemours & Company. [Cl. 117-161]

A composition containing *N*-methoxymethyl polyhexamethylene adipamide is suitable for coating rubber, paper, leather, textiles, and the like. E.G.S.

PAPER BREAKS

COOKSEY, OTHA. Web severing and clamping means. U. S. patent 2,492,968. Filed June 3, 1946. Issued Jan. 3, 1950. 15 claims. Assigned to The Collmar Corporation. [Cl. 164-39]

A web-severing device for coating machines is actuated by a solenoid; the mechanism is sufficiently small that it can be placed immediately adjacent to the rolls, thus preventing wrap-up, which may result from cutting the web too far from the rolls. E.G.S.

PAPER SPECIALTIES

ABERNATHY, HENRY H., and SCOTT, GEORGE W. Polychloroprene and preparation thereof. U. S. patent 2,493,798. Filed July 8, 1947. Issued Jan. 10, 1950. 6 claims. Assigned to E. I. du Pont de Nemours & Company. [Cl. 260-27]

A process is provided for preparing stable polychloroprene latices which can be used in the impregnation of paper; the latices have low moduli of elasticity and resist hardening during storage, particularly when in the unvulcanized state. E.G.S.

CASNATI, LOLA A. Sanitary holder for small articles. U. S. patent 2,471,308. Filed Dec. 8, 1947. Issued May 24, 1949. 12 claims. [Cl. 294-25]

A paper holder is provided with artificial gripping fingers for picking up small articles such as cotton wads, sterile gauze, and the like. E.G.S.

CROCKFORD, JOSEPH R. Method of making tampons. U. S. patent 2,458,685. Filed Dec. 14, 1945. Issued Jan. 11, 1949. 8 claims. Assigned to Harry Radzinsky and Sidney W. Dean, Jr. [Cl. 18-55]

A method is described for the formation and assembly of tampons of cellulose or viscose sponge, etc., provided with telescopic-type applicators. E.G.S.

DELMONTE, JOHN. Furfuryl alcohol-resorcinol resin composition. U. S. patent 2,462,054. Filed June 30, 1944. Issued Feb. 22, 1949. 5 claims. Assigned 72% to Ralph Hemphill. [Cl. 260-42]

The resinification of a resorcinol-furfural resin is arrested by the addition of a solvent such as alcohol or acetone; the resulting product is recommended as a laminating varnish for impregnating paper or cloth for hot pressing. E.G.S.

DE ORIBE, MARUJA G. V. Hygienic protector applicable to drinking vessels for avoiding contamination by the mouth. U. S. patent 2,459,558. Filed March 9, 1945. Issued Jan. 18, 1949. 1 claim. [Cl. 65-13]

A paper shield is folded over the edge of a drinking glass or cup to prevent contamination through labial contact. E.G.S.

DILLEHAY, EDWARD R., and SCHUETZ, ROBERT D. Furfuryl alcohol resin and process of making the same. U. S. patent 2,461,882. Filed March 24, 1945. Issued Feb. 15, 1949. 7 claims. Assigned to The Richardson Company. [Cl. 260-92.6; changed to 260-88.5]

Furfuryl alcohol is polymerized with heat under neutral conditions in the presence of water to produce a resinous material; sulfur serves as a catalyst. The resulting product may be mixed with a solvent (e.g., acetone, ethyl alcohol, etc.) to prepare a varnish for impregnating paper, linen, or canvas to render them acid-resistant. E.G.S.

GOEPFERT, GEORGE J., and ROBIE, NORMAN P. Abrasive articles and method of manufacturing the same. U. S. patent 2,468,056. Filed Oct. 24, 1944. Issued April 26, 1949. 9 claims. Assigned to The Carborundum Company. [Cl. 51-298]

A sizing coat for a sandpaper belt comprises the following: urea-formaldehyde resin, 85.1%; Accelerator A (an ammoniacal solution of sodium thiocyanate and thiourea), 8.5%; and furfuryl alcohol, 6.4%. E.G.S.

HARVEY, MORTIMER T. Compositions of matter and methods and steps of making and using the same. U. S. patent 2,461,510. Filed Oct. 30, 1947. Issued Feb. 15, 1949. 9 claims. Assigned to Harvel Research Corporation. [Cl. 260-64]

A laminating composition consists of 96 parts of furfuraldehyde, 58 parts of acetone, and 10 parts of a 10% sodium hydroxide solution. If a 2-mil saturating kraft paper is employed, an acetone or ethyl acetate solu-

tion of the resinous material is applied to one side of the sheet, and the saturated paper is baked at 250° F. for several minutes. A number of such sheets are laminated under a pressure of 2000-3000 p.s.i. at 280° F.; the time of curing ranges from 15 minutes to 5 hours. E.G.S.

HARWOOD, KENNETH J. Tampon. Canadian patent 462,243. Filed June 20, 1946. Issued Jan. 3, 1950. 7 claims. Assigned to International Cellucotton Products Company.

A process is described for forming, compressing, and kneading the core member of a catamenial tampon. E.G.S.

HEPNER, CHARLES. Method and apparatus for making batt-covered sheets. U. S. patent 2,493,968. Filed Oct. 17, 1946. Issued Jan. 10, 1950. 19 claims. [Cl. 154-29; changed to 154-31]

A method and apparatus are provided for crimping steel-wool pads on an adhesively coated paper sheet and for uniting the trough areas of the crimped batts to the paper backing. E.G.S.

HERMANSON, WILLIAM A. Soap powder packet. U. S. patent 2,470,851. Filed Oct. 25, 1945. Issued May 24, 1949. 1 claim. [Cl. 252-93; changed to 15-122]

A thin paper-web container (made of porous, wet-strength, absorbent paper) contains particles of soap which dissolve on contact with water. E.G.S.

IRMSCHER, HANS O. Infusion package with nontangling string handle. U. S. patent 2,458,169. Filed Nov. 6, 1945. Issued Jan. 4, 1949. 14 claims. Assigned to National Urn Bag Co. Inc. [Cl. 99-77.1]

A heat-sealed tea bag is constructed of filter paper, perforated parchment or cellophane, or cotton gauze. E.G.S.

JONES, HILTON I. Dusting and polishing paper. U. S. patent 2,495,066. Filed Dec. 12, 1945. Issued Jan. 17, 1950. 17 claims. Assigned to Munising Paper Company. [Cl. 15-208]

A combination dusting and polishing paper is formed by incorporating into a high wet- and dry-strength paper sheet a nondrying oil, one or more emulsifying or surface-active agents which are emulsifiable with water, and a plasticizing agent. E.G.S.

KEATON, CLARK M. Adhesive tape. U. S. patent 2,495,008. Filed Jan. 18, 1947. Issued Jan. 17, 1950. 3 claims. Assigned to American-Marietta Company. [Cl. 117-68.5]

A backing for a pressure-sensitive adhesive has the following composition: polyamide resin (solvent type), 45.5%; Polypale ester No. 1 (Hercules Powder Co.), 45.5%; and paraffin wax (m.p. 145° C.), 9.0%. The backing is flowed onto paper at about 100° C.; it exhibits very little penetration and is flexible. E.G.S.

POST, DURREL E. Poultry bag. U. S. patent 2,471,701. Filed April 12, 1946. Issued May 31, 1949. 1 claim. [Cl. 229-53]

A heavy paper bag for live poultry (e.g., chickens, ducks, etc.) is provided with a head opening and is equipped with quick-tying means for binding the open end of the bag around the legs of the fowl. E.G.S.

REIFSNYDER, JAMES D. Snap-on-cover. U. S. patent 2,493,086. Filed Feb. 19, 1949. Issued Jan. 3, 1950. 5 claims. Assigned to Lily-Tulip Cup Corporation. [Cl. 229-5.5; changed to 229-43]

A snap-on paper cover is provided for ice cream containers having a beaded upper lip. E.G.S.

REITANO, EDWARD S. Protective mask. U. S. patent 2,494,406. Filed March 17, 1949. Issued Jan. 10, 1950. 1 claim. Assigned to Sani-Mask Inc. [Cl. 128-146]

A paper facial mask is stitched around the edges to prevent fraying or tearing; elastic loops are attached which fit over the ears of the wearer. The mask is designed for protection against contagious diseases and industrial dusts. E.G.S.

ROSEN, SHY. Composite commodity wrapper. U. S. patent 2,494,965. Filed Dec. 27, 1946. Issued Jan. 17, 1950. 2 claims. Assigned to Milprint, Inc. [Cl. 229-87]

This corresponds to Canadian patent 454,312; *cf.* B.I.P.C. 19: 450. E.G.S.

SALFISBERG, LEROY L. Package. U. S. patent 2,457,924. Filed March 8, 1945. Issued Jan. 4, 1949. 2 claims. Assigned to Ivers-Lee Company. [Cl. 206-56]

A package for small articles (e.g., tablets, pills, buttons, etc.) consists of a compartmented bag or envelope which is enclosed by a foldable paper cover; cellophane, Pliofilm, metallic foil, cloth, or paper is a suitable material for the envelope. The package is so constructed that the articles may be removed individually. E.G.S.

SCHOLL, WILLIAM M. Mounting and mounting assembly for adhesived articles. U. S. patent 2,493,267. Filed July 24, 1944. Issued Jan. 3, 1950. 1 claim. [Cl. 206-80]

A mounting assembly for adhesively surfaced corn, callus, or bunion pads includes a mounting member of irregularly crinkled vegetable parchment having a glazy surface; the pads adhere only to the high spots on the mounting member. E.G.S.

SEARY, EUGENE G. Transparency mount and method of making same. U. S. patent 2,495,142. Filed Oct. 9, 1948. Issued Jan. 17, 1950. 5 claims. [Cl. 40-158]

A paper mount section is provided with integral projections which outline the transparency seat portion of the section and which may be obliterated after the transparency is properly placed between the two mount sections. E.G.S.

SMETANKA, RUDOLF, and PREININGER, MILOS. Paper for cigarettes. Canadian patent 462,149. Filed April 24, 1948. Issued Jan. 3, 1950. 4 claims.

In the manufacture of a cigarette paper, 3-25% of fine glass or asbestos fibers is added to the pulp at any stage in the process prior to water removal. E.G.S.

STEFAN, STANLEY B. Novelty package. U. S. patent 2,470,058. Filed June 29, 1945. Issued May 10, 1949. 3 claims. Assigned one half to Jane H. Stefan. [Cl. 46-151]

A candy bag is jacketed with a paper costume to resemble a doll. E.G.S.

STRAIN, FRANKLIN. Maleic anhydride resinous copolymer. U. S. patent 2,479,522. Filed March 25, 1944. Issued Aug. 16, 1949. 4 claims. Assigned to Pittsburgh Plate Glass Company. [Cl. 260-78.5; changed to 260-77.5]

A maleic anhydride resinous copolymer is suitable as a bonding and impregnating agent for laminated paper and textiles. E.G.S.

THURSTON, NORMAN R. Mounting corner. U. S. patent 2,493,276. Filed Jan. 12, 1948. Issued Jan. 3, 1950. 8 claims. Assigned to Eureka Specialty Printing Co. [Cl. 40-158]

A paper mounting corner is formed by die-punching and scoring a strip-gummed sheet, and is assembled by folding and interlocking the parts. E.G.S.

WHITMAN, GERALD M., and SCOTT, SAMUEL L. Polymerization of ethylene. U. S. patent 2,467,245. Filed Feb. 5, 1946. Issued April 12, 1949. 3 claims. Assigned to E. I. du Pont de Nemours & Company. [Cl. 260-94.9]

Solid polymers of ethylene are prepared by subjecting ethylene to pressures of 500-10,000 atm. at 150-300° C. in the presence of liquid ammonia and a catalytic amount of a Group II metal (e.g., barium, calcium, magnesium, cadmium, or zinc). The product is suitable as an impregnant and waterproofing agent for paper and textiles. E.G.S.

WOHNSIEDLER, HENRY P., and THOMAS, WALTER M. Colloidal melamine-urea-formaldehyde copolymer solutions. U. S. patent 2,485,080. Filed March 9, 1949. Issued Oct. 18, 1949. 1 claim. Assigned to American Cyanamid Company. [Cl. 260-29.4]

A colloidal aqueous solution of a melamine-urea-formaldehyde copolymer which contains acetic acid as the acidifying agent is specified as a laminating composition for paper. E.G.S.

PHYSICAL TESTING—PAPER—SIZE RESISTANCE

POLLOCK, JACOB. Moisture tester. U. S. patent 2,491,689. Filed May 9, 1945. Issued Dec. 20, 1949. 16 claims. Assigned to General Fibre Products Co. [Cl. 175-183]

The moisture permeability of a paper specimen is determined by measuring the decrease in resistance of the paper as a liquid electrolyte passes through the specimen. E.G.S.

PLASTIC FILMS (NONCELLULOSIC)

PETERS, LEO. Package wrapper. U. S. patent 2,469,204. Filed March 1, 1946. Issued May 3, 1949. 5 claims. Assigned two thirds to Leo Peters and one third to Helen M. Peters. [Cl. 99-171]

This corresponds to Canadian patent 461,205; *cf.* B.I.P.C. 20: 293. E.G.S.

ROHDIN, HOWARD A. Coloring package for oleomargarine. U. S. patent 2,469,521. Filed June 5, 1947. Issued May 10, 1949. 2 claims. [Cl. 99-148; changed to 99-171]

An oleomargarine package incorporates a color-containing capsule which is so located that it can not enter the body of the oleomargarine during or after the coloring operation. The wrapper comprises a film of latex, rubber hydrochloride, polyvinyl chloride, polyethylene, or the like. E.G.S.

PLASTICS

DOWLING, ARTHUR P. Plastic casket. U. S. patent 2,494,473. Filed July 29, 1944. Issued Jan. 10, 1950. 13 claims. Assigned to Plastics Products Corp. [Cl. 27-3]

A composite molded casket incorporates corrugated board on the outer faces and bottom of the box; in this manner, an allowance is made for relative shrinkage between the pine box and the outer layer of cast polymer. E.G.S.

PULP STONES

JEPPSON, GEORGE N., and HOWE, WALLACE L. Pulpstone. U. S. patent 2,495,656. Filed Aug. 27, 1947. Issued Jan. 24, 1950. 4 claims. Assigned to Norton Company. [Cl. 51-206.4]

A pulpstone construction incorporates very small abrasive blocks in order to reduce the internal heat stresses which tend to rupture larger blocks or segments. The use of holding bolts anchored or embedded in the abrasive blocks is eliminated. E.G.S.

ROOFING FELTS

HAMPTON, WILLIAM H., and SMITH, VAUGHN R. Method of protecting cellulosic material. U. S. patent 2,479,235. Filed Oct. 9, 1944. Issued Aug. 16, 1949. 3 claims. Assigned to California Research Corporation. [Cl. 117-143; changed to 196-22]

About 0.1-5% by weight of an oil-soluble lead soap of stearic, oleic, palmitic, phthalic, or lauric acids is added to an asphalt roofing compound to prevent deterioration of the paper felt by the hot asphalt. Lead tallate or oil-soluble lead soaps prepared from petroleum by-products (e.g., high molecular weight organic acids) may also be used. E.G.S.

SHIPPING CONTAINERS

ANDERSON, WILBUR G., JR. Folding paper box. U. S. patent 2,493,281. Filed Nov. 24, 1947. Issued Jan. 3, 1950. 7 claims. Assigned to American Box Board Company. [Cl. 229-23]

A re-usable paperboard container is designed for transporting baked goods from the bakery to the retail store; the upper edge of the container is reinforced with an open wire frame. E.G.S.

MAKRIANES, JAMES K. Display and shipping container. U. S. patent 2,460,230. Filed July 18, 1947. Issued Jan. 25, 1949. 2 claims. [Cl. 211-60]

A cardboard or corrugated board shipping container for golf clubs is suitable for display purposes. E.G.S.

WELLS, WILLIAM J. Display and shipping carton. U. S. patent 2,495,676. Filed Jan. 22, 1945. Issued Jan. 24, 1950. 3 claims. Assigned to F. N. Burt Company, Inc. [Cl. 206-44]

A cardboard shipping carton for boxes of cigarettes is provided with front and rear panels which can be inclined for display purposes. E.G.S.

SHIPPING CONTAINERS—MULTIWALL BAGS

HOPPE, EDGAR B. Bag with extensile sealed liner. U. S. patent 2,493,348. Filed Sept. 21, 1944. Issued Jan. 3, 1950. 1 claim. Assigned to St. Regis Paper Company. [Cl. 229-55]

This is similar to Canadian patent 446,436; *cf.* B.I.P.C. 18: 490. E.G.S.

HOPPE, EDGAR B. Bag with extensile sealed liner and method for making same. U. S. patent 2,493,349. Filed Nov. 30, 1946. Issued Jan. 3, 1950. 2 claims. Assigned to St. Regis Paper Company. [Cl. 229-55]

This is similar to Canadian patent 446,436; *cf.* B.I.P.C. 18: 490. E.G.S.

REID, JOHN D., WARD, WESLEY K., JR., and MAZZENO, LAURENCE W., JR. Prevention of degradation of textile fibers by acids. U. S. patent 2,493,031. Filed March 29, 1946. Issued Jan. 3, 1950. 1 claim. Assigned to the United States of America as represented by the Secretary of Agriculture. [Cl. 206-84]

A multi-ply paper bag for acid fertilizer is sewed with thread (e.g., cotton, sisal, jute, linen, monoacetylated cotton, paper cord, or viscose rayon) which has been impregnated with about 20% by weight of triethanolamine. E.G.S.

SHIPPING CONTAINERS—PALLETIZING

THURSBY, ARTHUR H. Palletized container. U. S. patent 2,494,730. Filed Jan. 29, 1949. Issued Jan. 17, 1950. 5 claims. Assigned to Inland Container Corporation. [Cl. 229-16]

A corrugated board palletized container is essentially an open box with filled corrugated cleats secured to the bottom of the box. E.G.S.

SOY-BEAN

DAVIDSON, GLENN. Process for simultaneously recovering protein and hemicellulose from oil seed residue meal. U. S. patent

2,464,075. Filed June 2, 1948. Issued March 8, 1949. 4 claims. [Cl. 260-112; changed to 106-154]

A process is described for the recovery of hemicellulose and protein from soybean meal; the product is recommended for use in the preparation of clay coating color, as a sizing and laminating agent, etc. E.G.S.

STRAW

LEVY, ROBERT M. Sampling device. U. S. patent 2,459,383. Filed Dec. 7, 1945. Issued Jan. 18, 1949. 6 claims. Assigned to Ecusta Paper Corporation. [Cl. 73-421]

A mechanical device is provided for removing a representative sample from a bale of straw or bast fibers; the cutting tool consists of an elongated tube having a circular knife edge formed at the end for cutting into the bale. E.G.S.

SULFITE WASTE LIQUOR

GLYCOFRIDES, EUSTACE. Urea formaldehyde type of molding compounds and method of producing same. U. S. patent 2,470,393. Filed Sept. 2, 1944. Issued May 17, 1949. 2 claims. Assigned to Owens-Illinois Glass Company. [Cl. 260-17.3]

A thermosetting molding compound has the following composition by weight: urea, 152 parts; commercial formaldehyde (37% solution), 304 parts; sodium hydroxide (10% solution) as a catalyst, 11 parts; Marathon lignocellulose (78%), 780 parts; carbon black (2%), 20 parts; and zinc stearate, 20 parts. E.G.S.

LOCKMAN, CARL J. Automatically controlled recovery of heat and SO_2 gas from relief gases and waste liquor. U. S. patent 2,494,098. Filed June 22, 1943. Issued Jan. 10, 1950. 1 claim. Assigned to American Heat Reclaiming Corporation. [Cl. 92-11]

A system for the recovery of heat and sulfur dioxide from relief gases and sulfite waste liquor comprises the continuous relief of the digester during the discharge of waste liquor, the passage of the relief gases and the flash vapor from the liquor to a common chamber, and the transfer of the resulting mixture to a heat-exchange system. E.G.S.

MACPHERSON, DONALD R., FRANCE, WESLEY G., and ERNSBERGER, FRED M. Cement composition and indurating mixture therefor. U. S. patent 2,485,102. Filed Nov. 29, 1945. Issued Oct. 18, 1949. 9 claims. Assigned to The Master Builders Company. [Cl. 106-90]

A hydraulic cement composition incorporates the dialyzed lignin residuum solids retained by the dialyzing membrane in the dialysis of sulfite waste liquor which has not been preconcentrated (i.e., the specific gravity of the liquor is less than 1.1) and which has not been neutralized prior to dialysis. E.G.S.

STEWART, WILLIAM D. Organic polysulfides. U. S. patent 2,470,115. Filed June 13, 1945. Issued May 17, 1949. 5 claims. Assigned to The B. F. Goodrich Company. [Cl. 260-17.5]

A stable dispersion of polyethylene polysulfide particles (not larger than 1-3 microns in diameter) in an aqueous medium is obtained by preparing an aqueous reaction mixture of ethylene dichloride, sodium polysulfide, and a lignin sulfonate, and agitating the mixture at 20-60° C. The dispersion is suitable for coating and impregnating paper, textiles, leather, and the like. E.G.S.

TALL OIL

BARKER, GEORGE E. Synthetic detergent composition. U. S. patent 2,469,493. Filed July 2, 1947. Issued May 10, 1949. 5 claims. Assigned to Atlas Powder Company. [Cl. 252-161]

A detergent composition for washing cotton fabrics comprises a mixture of 60-85% of sodium alkyl benzene sulfonates and 15-40% of a polyoxyethylene ester of tall oil containing an average of 12-30 oxyethylene groups per carboxyl group. The alkyl groups have chain lengths which are equivalent to those of kerosene hydrocarbons. E.G.S.

GREENLEE, SYLVAN O. Tall oil esters. U. S. patent 2,493,486. Filed April 10, 1946. Issued Jan. 3, 1950. 4 claims. Assigned to Devoe & Raynolds Company, Inc. [Cl. 260-18]

Synthetic drying compositions are prepared by the esterification of high-molecular weight, polymeric, polyether, polyhydric alcohols with tall oil acids. E.G.S.

JOLLY, SAMUEL E. Sulfurized nitriles and process of preparing the same. U. S. patent 2,490,271. Filed June 25, 1943. Issued Dec. 6, 1949. 3 claims. Assigned to Sun Oil Company. [Cl. 260-97.5]

Oil-soluble sulfurized nitriles are prepared from the nitriles of tall oil by the reaction of the nitriles with sulfur at a temperature above 190° C., but below the decomposition temperature of the sulfurized nitriles, for 5-35 minutes. The sulfurized product is a useful base stock for nonemulsifiable, mild, extreme-pressure lubricants, emulsifiable cutting oil, and greases; sulfurized nitriles may be adapted for use in special lubricants which are noncorrosive to such metals as brass, copper, bronze, and aluminum, by treatment with an alkali to remove free or loosely bound sulfur. E.G.S.

SEGESSEMANN, ERNEST, and MOLNAR, NICHOLAS M. Tall oil treatment. U. S. patent 2,481,356. Filed April 20, 1948. Issued Sept. 6, 1949. 6 claims. [Cl. 260-97.5]

The unsaturated fatty acids in tall oil are degraded mainly to palmitic and myristic acids by heating a sodium or potassium soap of tall oil with sodium or potassium hydroxide at 230-290° C. under a pressure of 5-20 atm. for six hours. The resulting saturated fatty acids may be used in the manufacture of hard soaps. E.G.S.

TEXTILE INDUSTRY AND FABRICS—FIREPROOFING

HERSH, JOSEPH M. Method for preparing pentamethylene silicone polymers. U. S. patent 2,464,231. Filed June 18, 1945. Issued March 15, 1949. 3 claims. Assigned to Continental Oil Company. [Cl. 260-448.2]

A polyhalogenated silicone composition is adapted for use as a fire-, fungus-, and insectproofing agent in impregnating and coating baths. The

composition may be applied to fabrics, plastics, wood, and other construction materials. E.G.S.

WET STRENGTH

AUTEN, ROBERT W. Urea resins containing aminoalkoxy substituents. U. S. patent 2,471,188. Filed July 28, 1945. Issued May 24, 1949. 5 claims. Assigned to Rohm & Haas Company. [Cl. 260-70]

A wet-end additive is prepared by combining dimethylolurea with dimethylaminoethanol; the composition is recommended for high-wet strength paper. E.G.S.

WOHNSIEDLER, HENRY P., and THOMAS, WALTER M. Colloidal melamine-urea-formaldehyde copolymer solutions. U. S. patent 2,485,079. Filed Jan. 4, 1944. Issued Oct. 18, 1949. 1 claim. Assigned to American Cyanamid Company. [Cl. 260-29.4]

A formaldehyde condensation product containing 70 mole-% of urea and 30 mole-% of melamine forms a colloidal cationic solution which can be added to kraft or sulfite pulp in the beater; the resulting paper has good wet-strength properties. E.G.S.

WOOD TRANSPORTATION

BERRY, WILLIAM A. Stake releasing means for vehicle log bunks. U. S. patent 2,469,760. Filed Feb. 11, 1947. Issued May 10, 1949. 1 claim. [Cl. 280-145]; Canadian patent 462,432. Filed March 21, 1949. Issued Jan. 17, 1950.

Means are provided for mechanically actuating hinged stakes on log-hauling trailers; the stakes are held positively in an upright position and are released from a remote point. E.G.S.

LEHTO, EINO, SAARI, MATT, and ANDERSON, EDWARD J. Snatch block. Canadian patent 462,383. Filed Dec. 6, 1947. Issued Jan. 10, 1950. 6 claims. Assigned to Marathon Corporation.

This corresponds to U. S. patent 2,491,069; *cf.* B.I.P.C. 20: 378. E.G.S.

WHALLEY, JOHN E. Removable log bunk. U. S. patent 2,491,067. Filed July 17, 1945. Issued Dec. 13, 1949. 3 claims. [Cl. 105-160]

A log bunk is described which can be quickly mounted on and removed from a standard flatcar or truck, so that the vehicle can be used alternately in logging and general service. E.G.S.

AUTHOR INDEX TO BOOKS

Beilstein, F. K. 379
British Standards Institute 379
Bruce, D. 380
Bullinger, C. E. 379
Glasstone, S. 379
Great Britain. *Department of Scientific and Industrial Research* 380
Kruyt, H. R., ed. 379
McArdle, R. E. 380
Meyer, W. H. 380
Northeastern Wood Utilization Council 379
Paper Makers Association of Great Britain and Ireland 379
Richter, F., ed. 379
U. S. Dept. of Agriculture 380
Valasek, J. 379

AUTHOR INDEX TO ABSTRACTS

The letter P preceding a page number indicates a patent abstract.

Abernathy, H. H. .....P 455
Adams, D. O. .....P 441
Aderhold, H. H. 425
Alton Box Board Company .....P 448
American Box Board Company .....P 460
American Cyanamid Company ....P 454, P 459, P 464
American Heat Reclaiming Corporation .....P 462
American-Marietta Company .....P 457
Anderson, E. J. .....P 464
Anderson, N. A. .....P 448
Anderson, S. L. 394
Anderson, W. G., Jr. .....P 460
Andersson, O. 424
Aries, R. S. 411
Arkell & Smiths 426
Arnell, J. C. 434
Aston, R. N. .....P 446
Atchison, J. E. 429
Atlantic Carton Corporation .....P 447
Atlas Powder Company .....P 463
Auten, R. W. .....P 464
Ayre, J. A. .....P 446
Badger, W. L. 394
Bailar, C. O. .....P 443
The Baker Castor Oil Company ....P 454
Banks, W. H. 383
Barker, G. E. .....P 463
Bartlett, G. 405
Beloit Iron Works .....P 450
The Bengal Paper Mill Co., Ltd. ... 414
Bernson, I. 431
Bernstein, J. M. 418
Berry, W. A. .....P 464
Bicknell, J. A. .....P 452
Bishop, F. W. 430
Blaine, R. L. 395
Bland, D. E. 391
Blatt, J. L. 426
Bloomer Bros. Company .....P 448
Booth, G. M. .....P 446
Bowers, H. E. 439
Boxart Machine Company .....P 451
Broeren, F. L. .....P 447
Bromley, W. H., Jr. .....P 452
Brown, A. J. 398
Bruker, H. W. .....P 448
Brunes, B. 432
Buckley, W. D. .....P 441
Burbank, W. T. .....P 451
Burt, F. N., Company, Inc. .....P 461
Butterfield, D. E. 400
Buttery, K. T. .....P 447
Cahn, L. 418
California Research Corporation ....P 460
Callahan, T. P. 410
Campbell, B. 388
Canadian Line Materials, Limited ..P 445
The Carborundum Company .....P 456
Carlisle, K. W. 398
Carlsson, S. 407
Casciani, F. .....P 442
Casnati, L. A. .....P 455
Celli, M. C. 408
Central Laboratory of the Cellulose Industry. *Analysis Committee* 390
Chaplin, M. P. .....P 452
Chaplin Corporation .....P 452
Chemical Engineering 386
Cincinnati Industries, Inc. .....P 449
Clapperton, R. H. 409
Clegg, D. L. 391
Clurman, A. W. .....P 442
Collins, H. A. .....P 449
Collins, T. T., Jr. 382
The Collmar Corporation .....P 455
Combustion Engineering-Superheater Inc. .....P 440
Continental Oil Company .....P 463
Cook, R. E. 403
Cooksey, O. .....P 455
Cooper, R. S. 400
Copulsky, W. 411
Cornell, J. 386
Coupe, R. R. 383
Cowan, D. P. 398
Crocker, E. C. 410
Crockford, J. R. .....P 456
Crowley, E. L. 382
Crown Zellerbach Corporation .....P 441
Daul, G. C. 388
Davidson, G. .....P 461
Davis, E. B. 406
Davis, H. D. 418
Dean, S. W., Jr. .....P 456
de Bruyne, N. A. 435
Delcroix, P. 430
Delmonte, J. .....P 456
de Oribe, M. G. V. ..... P 456
de Swart, J. .....P 443
Devoe & Raynolds Company, Inc. ...P 463
Dewey and Almy Chemical Company P 453
Dickson, R. A. 406
Dillehay, E. R. .....P 456
Dorrington, N. E. .....P 451
Dorst, P. W. .....P 449
Dow Corning Corporation 415
Dowling, A. P. .....P 460
Dungler, J. .....P 450
Dunlop, R. D. .....P 453, P 455
du Pont de Nemours, E. I., & Company .....P 455, P 459
Eckstein, K. J. .....P 449
Ecusta Paper Corporation .....P 462
Edmondston, W. H. .....P 450
Ellern, H. .....P 443
Elmendorf, A. 384
Epps, T. B. .....P 443
Ernsberger, F. M. .....P 462
Essen, C.-G. von 392
Eureka Specialty Printing Co. .....P 459
Evans, D. M. 401
Evans, R. N. .....P 442
Fair, A. E. H. 413
Fiberboard Products Inc. .....P 448
Fibre Containers 385
Fletcher, H. B. 398
Fobes, E. W. 404
Foster, J. L. 383

Fourness, C. A. ..... P 449
France, W. G. ..... P 462
Frankenstein, W. P. ..... P 447
Friedman, S. J. 393
Funk, C. S. 418
Gagliardi, D. D. 435
Gagliardi, E. A. J. ..... P 440
Gale, M. M. 400
Gaylord Container Corporation ..... P 444
General Fibre Products Co. ..... P 459
George, W. C. ..... P 443
Gerhardt, F. 419
Gersten, L. ..... P 444
Gilbert, G. A. 427
Gittens, S. R. ..... P 444
Glanzer, P. 432
Glycofrides, E. ..... P 462
Godwin, J. F. ..... P 448
Goepfert, G. J. ..... P 456
Gold, L. J. ..... P 453
Goodrich, The B. F., Company .... P 442, P 462
Goodwillie, J. E. ..... P 450
Gore, R. C. 427
Graham, B. ..... P 455
Granberg, W. J. 384
Greenlee, S. O. ..... P 463
Greenlie, D. G. ..... P 453
Groome, E. S. 439
Haas, F. J. ..... P 451
Habib, E. E. ..... P 453
Hall, A. G. 435
Hamilton, W., Jr. 415
Hamm, A. L. ..... P 440
Hamm, F. A. 408
Hampel, C. A. 425
Hampton, W. H. ..... P 460
Hanson, J. E. 418
Hartman, C. H. ..... P 451
The Harvel Corporation ..... P 453
Harvel Research Corporation ..... P 456
Harvey, M. T. ..... P 453, P 456
Harwood, K. J. ..... P 457
Hassid, W. Z. 428
Heino, A. W. ..... P 443
Hemphill, R. ..... P 456
Hepner, C. ..... P 457
Hermanson, W. A. ..... P 457
Hersh, J. M. ..... P 463
Hickler, W. R. ..... P 442
Hicks, T. G. 403
Hirst, E. L. 409
Hodge, W. W. 430
Holderby, J. M. 432
Hollis, R. F. ..... P 448
Holzer, W. F. 437
Hoppe, E. B. ..... P 461
Horning, R. H. ..... P 444
Horsley, J. 406
Hough, L. 409
Howard, S. R. ..... P 451
Howe, W. L. ..... P 460
Huber, K. 390
Hudson, W. G. 407
Hughey, G. B. ..... P 441
Hultin, O. H. ..... P 444
Hunt, C. M. 395
Hyde, A. D. 409
Hygrade Corrugated Products Limited ..... P 444
Imset, O. ..... P 448
Ingrassia, A. P. ..... P 442
Inland Container Corporation ..... P 461
Inman, W. H. ..... P 448
International Cellucotton Products Company ..... P 449, P 457
Irmscher, H. O. ..... P 457
Ivarsson, B. 424
Ivers-Lee Company ..... P 458
Jackson, D. T. 381
Jacobs, M. ..... P 442
Jayne, J. E. 381
Jeppson, G. N. ..... P 460
Johnson, H. A. ..... P 451
Jolly, S. E. ..... P 463
Jones, H. I. ..... P 457
Jones, J. K. N. 409
Jørgensen, L. 395
Joslyn, M. A. 428
Jubanowsky, L. J. ..... P 454
Juvonen, V. V. 434
Kainer, F. 416
Karlsson, K. A. ..... P 450
Katheder, F. 388
Katz, A. 435
Keaton, C. M. ..... P 457
Keggin, J. F. 429
Kenyon, E. M. 410
Kidd, J. W. ..... P 444
Kilpper, W. 382
King, C. F. 421
Klasing, A. P. ..... P 443
Klause, K. ..... P 448
Kolthoff, I. M. 400
Kooi, M. 427
Kraft, A. A. 389
Krasny, J. F. 439
Kropa, E. L. ..... P 454
Kuehl, R. ..... P 447
Kunin, R. 402
La Cour, E. J. ..... P 450
Lagally, P. 437
Lalk, R. H. 411
Lansky, S. 427
Latimer, R. 407
Lehto, E. ..... P 464
Levy, R. M. ..... P 462
Lewis, A. M. ..... P 447
Lewis, H. F. 412
Lily-Tulip Cup Corporation ..... P 458
Lindberg, N. J. 399
Lindsay, R. A. 394
Lockman, C. J. ..... P 462
M. A. 416
McColl, B. J. 439
McCoy, P. E. ..... P 441
Macdougall, G. 421
McFall, W. W. ..... P 444
MacKenzie, R. S. 407
Mackey, J. H. 398
MacPherson, D. R. ..... P 462
Magnusson, J. ..... P 452
Makara, F. 418
Makrianes, J. K. ..... P 461
Malcolmson, J. D. 397
Marathon Corporation P 443, P 447, P 464
Marsh, E. A. ..... P 451
Martaing, J. 422
Marts, R. O. 408
Mason, S. G. 396
Masonite Corporation ..... P 442
The Master Builders Company ..... P 462
Mathieson Chemical Corporation ..... P 446
Mazzeno, L. W., Jr. ..... P 461
The Mead Corporation ..... P 446
Meier, A. M. ..... P 448
Meller, A. 386
Mellor, C. ..... P 440
Middlebrook, M. 426
Miller, S. A. 405
Milprint, Inc. ..... P 453, P 458
Minnesota Mining and Manufacturing Company. 416
Modern Packaging 416, 425
Molnar, N. M. ..... P 463

Monsanto Chemical Company ..... P 453, P 454, P 455
Montgomery, M. J. 393
Moore, G. A. ..... P 446
Moraine Box Company 385
Morris, G. 429
Morrison, R. I. 388
Mueller, R. W. 381
Mueller, W. G. ..... P 448
Müller, R. H. 401
Munising Paper Company ..... P 457
Nash, L. K. 400
National Biscuit Company ..... P 446
National Southern Products Corporation 434
National Urn Bag Co. Inc. ..... P 457
Nazzaro, R. T. 417
Newberg, R. G. 411
Niagara Alkali Company ..... P 442
Nichols, P. L., Jr. ..... P 454
Nissan, A. H. 424
Norton Company ..... P 460
Novadel-Agene Corporation ..... P 446
Nuessle, A. C. 435
Ode, W. H. 436
The Ohio Boxboard Company ..... P 445
O'Neil, J. B. 392
Orchard Paper Company ..... P 450
Orel, R. 438
Orr, D. B. 437
Oswego Falls Corporation ..... P 444
Ott, E. 387
Owens-Illinois Glass Company ..... P 462
P. G. 430
Pacsu, E. 389, 427
Pagé, J. E. L. ..... P 452
Paine, F. A. 424
Paper Sales 417
Papirindustriens Forskningsinstitutt P 448
Parkin, E. A. 400
Pehrson, S. O. 399
Percival, E. G. V. 387
Perkins, H. A. ..... P 449
Peters, H. M. ..... P 460
Peters, L. ..... P 460
Petersen, R. 435
Pfeil, E. W. ..... P 444, P 445
Pichette, A. H. 434
Pittsburgh Plate Glass Company .... P 459
Plastics Products Corp. ..... P 460
Pneumatic Scale Corporation, Limited ..... P 444, P 451, P 452
Pollock, J. ..... P 459
Pollok, F. J. 388
Poor, E. N. 422
Porter, C. C. 430
Post, D. E. ..... P 457
Potter, A. L. 428
Pouliot, L. J. 412
Preininger, M. ..... P 458
Preston, J. M. 394
Preston, R. D. 426
Proctor, B. E. 410
Pulp Reproduction Company ..... P 452
Radio Corporation of America ..... P 454
Radzinsky, H. ..... P 456
Reed, G. 394
Regestad, S. O. 431
Reid, J. D. ..... 388, P 461
Reifsnyder, J. D. ..... P 458
Reitano, E. S. ..... P 458
Renard, A. 409
Renard, J. 429
Richardson, R. R. ..... P 450
The Richardson Company ..... P 456
Riddell, G. L. 423, 424
Risch, A. H. ..... P 452
Ritter, S. ..... P 445
Robertson, A. A. 396
Robie, N. P. ..... P 456
Rohdin, H. A. ..... P 460
Rohm & Haas Company ..... P 464
Rohman, A. 404
Rose, L. 422
Rosen, S. ..... P 458
Rosenthal, F. ..... P 454
Ross, A. G. 387
Rowe, R. C. 413
Rowe, W. W. ..... P 449
Rowen, J. W. 395
Rueckert, D. E. ..... P 445
Ruff, H. T. ..... P 446
Rushton, J. H. 406
Ruthman, K. S. ..... P 442
Saari, M. ..... P 464
Sagarin, E. 410
St. John, E. 421
St. Regis Paper Company .... P 451, P 461
Salfisberg, L. L. ..... P 458
Samuelson, O. 422, 431
Sani-Mask Inc. ..... P 458
Savage, J. V. 383
Schiefer, H. F. 439
Schnyder, A. P. 408
Schoch, T. J. 427
Scholl, W. M. ..... P 458
Schroeder, A. R. 402
Scheutz, R. D. ..... P 456
Schwartz, A. 397
Scott, G. W. ..... P 455
Scott, S. L. ..... P 459
Seary, E. G. ..... P 458
Segessemann, E. ..... P 463
Segesser, J. R. 418
Selvig, W. A. 436
Setchkin, N. P. 419
Setter Bros. Inc. ..... P 449
Seyb, L. P. 383
Shallcross, R. E. 393, 422
Shawinigan Resins Corporation .... P 452
Shellmar Products Corporation ..... P 443
Sherbondy, W. A. ..... P 445
Skaperdas, G. T. 400
Sloan, L. L. 391
Smetanka, R. ..... P 458
Smith, F. W. 413
Smith, L. T. ..... P 454
Smith, V. R. ..... P 460
Spalding, T. L. ..... P 443
Sparks, W. J. ..... P 454
Stancal Asphalt & Bitumuls Company P 441
Standard Insulation Corporation 417
Standard Oil Development Company P 455
Staniar, W. 403
Steele, R. 389, 427
Steenberg, B. 424
Stefan, J. H. ..... P 459
Stefan, S. B. 459
Steffens, O. R. 428
Steinman, A. S. ..... P 445
Steinman, N. ..... P 445
"Stenson" 436
Stephansen, E. ..... P 448
Steurer, E. 388
Stevenson, J. F., Jr. ..... P 446
Stewart, W. D. ..... P 462
Stilbert, E. K. 411
Storin, G. K. ..... P 442
Strachan, J. 392, 396
Strain, F. ..... P 459
Strain, H. H. 391
The Sulphite Pulp Manufacturers' Research League, Inc. *Investigating Committee* 433
Sun Oil Company ..... P 463
Surprenant, J. L. ..... P 450

Sutherland Paper Company ..P 447, P 451
Svedberg, The. 387
Swallow, A. J. 427
Swift, F. H. .....P 441
Swift, G. W., Jr., Inc. .....P 449
Swift & Company .....P 445
Tall Oil Association 435
Tarassuk, N. P. 426
Technical Papers Corporation 417
The Texas Company 403
Thomas, W. M. .....P 459, P 464
Thursby, A. H. .....P 461
Thurston, N. R. .....P 459
Todd, W. L. 414
Tongren, J. C. 381
Toulouse, J. H. 429
Truchon, R. .....P 452
Tucker, E. F. 393
Turner, A. J. 396
Turner, H. S. .....P 455
Tuttle, O. S. 419
Twerdal, M. P. 438
Tyler, R. G. 431
United Biscuit Company .....P 450
United States Gypsum Company ...P 442
U. S. Dept. of Agriculture. *Secretary of Agriculture* .....P 454, P 461
Universal Match Corporation .....P 443
Vanant Products Inc. 402
Visger, R. D. 411
von Liedtke, R. H. .....P 445
Wall, T. P. 401
Wallace, C. F. .....P 445
Wallace & Tiernan Products, Inc. ..P 445
Walter, H. A. .....P 454
Walter, H. E. .....P 440, P 441
Wandel, K. .....P 452
Wanderstock, J. J. 389
Warburton, F. L. 394
Ward, W. K., Jr. .....P 461
Waring, F. H. 431
Warren, S. D., Company .....P 452
Wauda, G. E .....P 447
Wawzonek, S. 420
Weiler, P. B. .....P 447
Wells, W. J. .....P 461
Werner, K. 381
West Virginia Pulp and Paper Company .....P 441
Westbilt Forms, Inc. 385
Weyandt, C. S. .....P 451
Whalley, J. E. .....P 464
Whitehead, E. B. .....P 447
Whitman, G. M. .....P 459
Wiley, A. J. 432
Willey, G. S. .....P 442
Wohnsiedler, H. P. .....P 459, P 464
Wood Conversion Company ....P 440, P 441, P 443
Woodside, L. M. 405
Worthington, N. P. 438
Wright, R. E. 408
Yarman, P. J. .....P 445
Yorston, F. H. 433, 434
Young, D. W. .....P 454
Younghusband, J. L. .....P 446
Yuill, A. M. 429
Ziegenbusch, C. W. 406

LIBRARY SERVICE

The Library of The Institute of Paper Chemistry is located in the Kimberly Memorial Building. Its purpose is to serve the students and the faculty of The Institute of Paper Chemistry and the chemists and technologists of the pulp and paper industry.

To contributing members it gives the following service:

A monthly bulletin is issued, listing all new books and periodicals added to the library and containing titles and abstracts of articles published during the previous month in the field of pulp and paper chemistry and technology. The annual index carries a list of periodicals currently received.

At a reasonable cost the librarian will furnish complete reference lists on chemical and technical problems for member mills, and will procure translations, photostats, or abstracts of the articles listed. Upon request, member mills working on special problems will be kept in touch with new publications related to their work.

Reviews of new publications pertaining to the field of pulp and papermaking will be included from time to time.

The library is open daily with the exception of Sundays from 8:00-5:00 and from 7:30-9:30. Saturday it closes at 5:00 o'clock.